

MOTOR AGE

Vol. XXXIII
No. 5

CHICAGO, JANUARY 31, 1918

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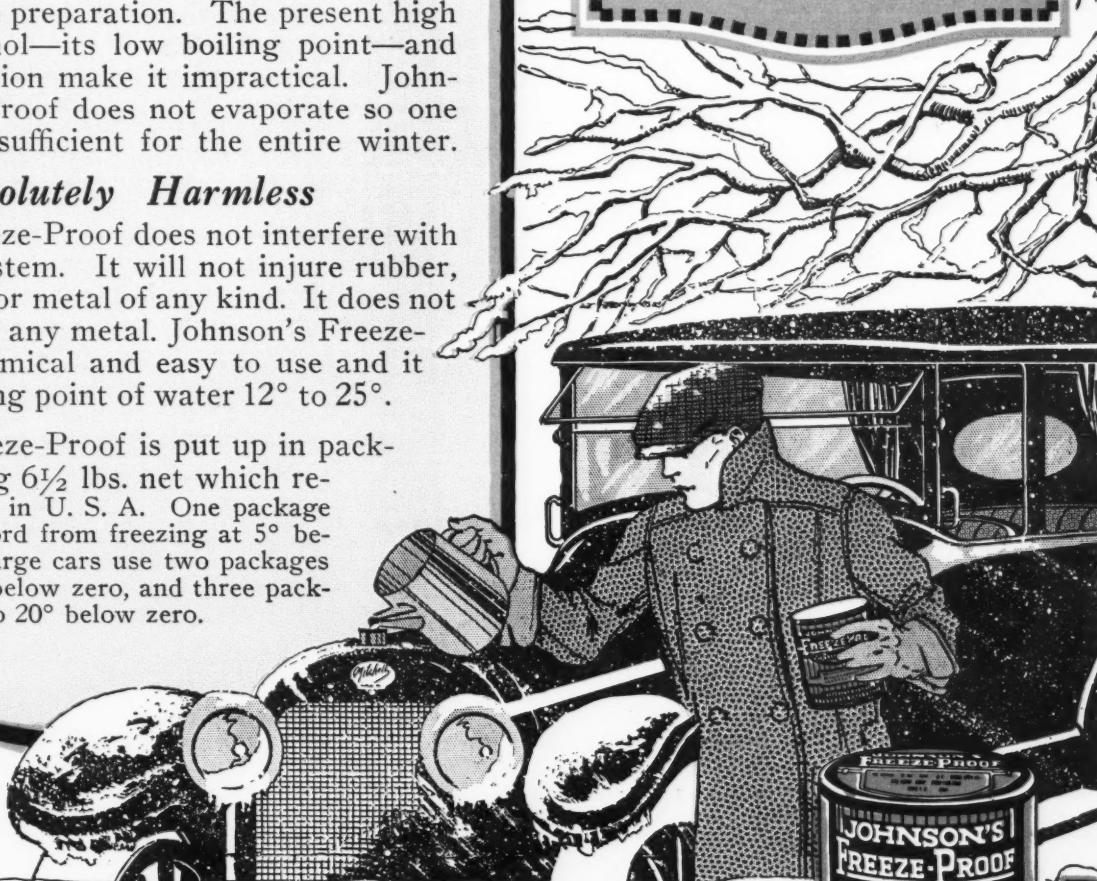
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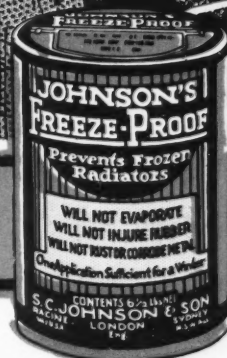
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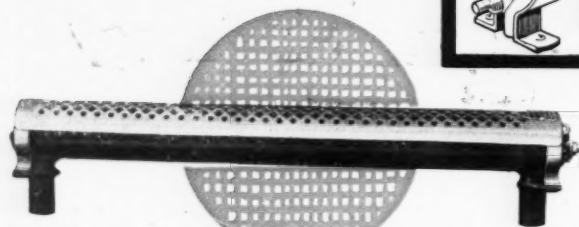
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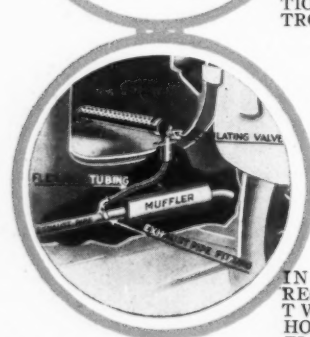
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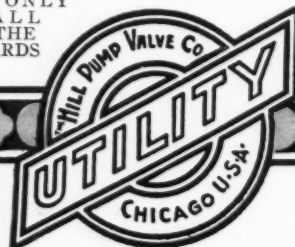
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MOTOR AGE

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Contents

CHICAGO COLISEUM IN PANOPLY OF WAR...	5
THE ARISTOCRACY OF MOTORDOM EXHIBITS 11	
EDITORIAL—OUR NATIONAL SHOW—AMERICAN CARS IN B. S. A.—OUR ESSENTIAL INDUSTRY	12
EFFECT OF FIVE-DAY CLOSE ON INDUSTRY...	15
U. S. WILL CONTROL GAS.....	17
NEW OFFERINGS AT THE CHICAGO SHOW....	20
FALLACIES IN BATTERY LOCATIONS.....	26
OUR REAL NEED IS TRANSPORTATION.....	28
IN THE WAR ZONE OF THE VELDT—II.....	32
ELECTRICAL EQUIPMENT OF THE MOTOR CAR	36
AMERICAN SLEEVE-VALVE ENGINE.....	46

DEPARTMENTS

MOTOR CAR REPAIR SHOP.....	38
ACCESSORY CORNER	39
READERS' CLEARING HOUSE.....	40
AMONG THE MAKERS AND DEALERS.....	47
FROM THE FOUR WINDS.....	48

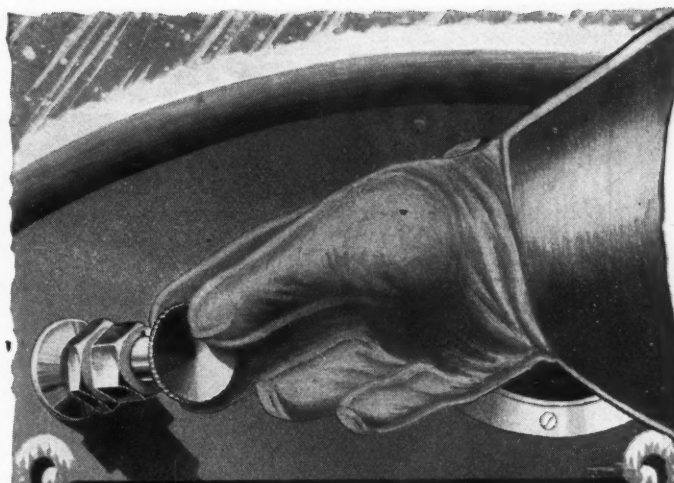
DELAYS AND WARI

Delays are part of the price of war. Mail trains, like most others, are often delayed these days.

Because of the enormous pressure of traffic incident to the war, MOTOR AGE, like other periodicals, must stand its share of delays.

MOTOR AGE asks its readers to take this into consideration when their copies fail to arrive at the expected hour. As a rule, you can feel assured that your copy is safely on its way, but naturally delayed because of the above conditions.

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when equipped with the

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No need to waste the starter battery spinning the motor, trying to raise and vaporize the gasoline from the cold carburetor.

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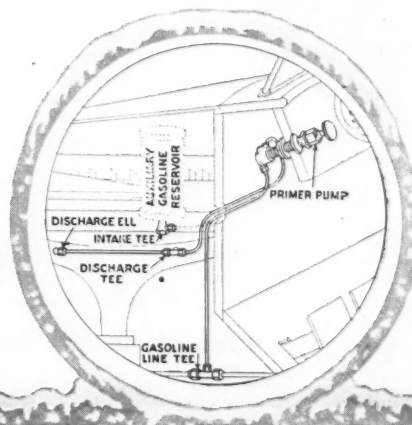
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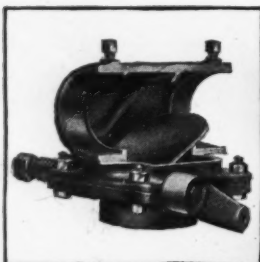
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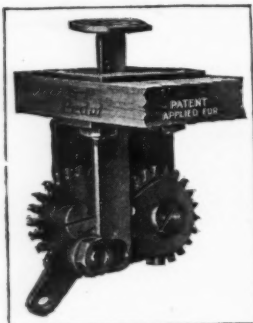
Keep your engine fit—nip trouble in the bud

Don't overlook the little engine troubles. They soon develop into big ones. Know what your engine is doing, and it's easy to keep it right.

Put a G-P Muffler Cut-Out on your car. It accentuates the purr of the engine and warns against power wastage. The G-P calls attention to operating defects that escape the unaided ear. It cuts cost by saving power.

The G-P Muffler Cut-Out is built simply and strong. Gases exhaust fully with no possibility of back-pressure. It literally blows the carbon out of your engine. Carbon can not accumulate. Made in two parts permitting quick and thorough access to interior. Gives complete cooling relief to the motor. Put one on and know at any time what your engine is doing. It will save gas and increase power.

The G-P Muffler Cut-Out and G-P PEDAL

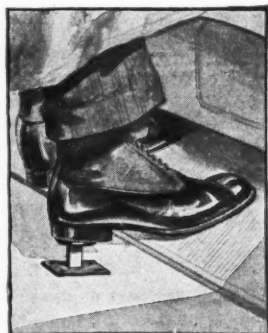


The G-P Pedal is made entirely of steel, and is strong enough to operate any cut-out spring. The geared compound leverage makes it easy to operate.

Compounding of leverage and geared parts allows installation in minimum space. Its installation requires but one small hole drilled in floor board. The locking

device is on the bottom plate, so the pedal can be fastened to a steel or wood floor board of any thickness without altering its throw.

By releasing one screw the G-P Pedal can be changed to lift or pull in any direction. Operates any cut-out easily.



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MOTOR AGE

Chicago Coliseum *in* Panoply of War

By Darwin S. Hatch

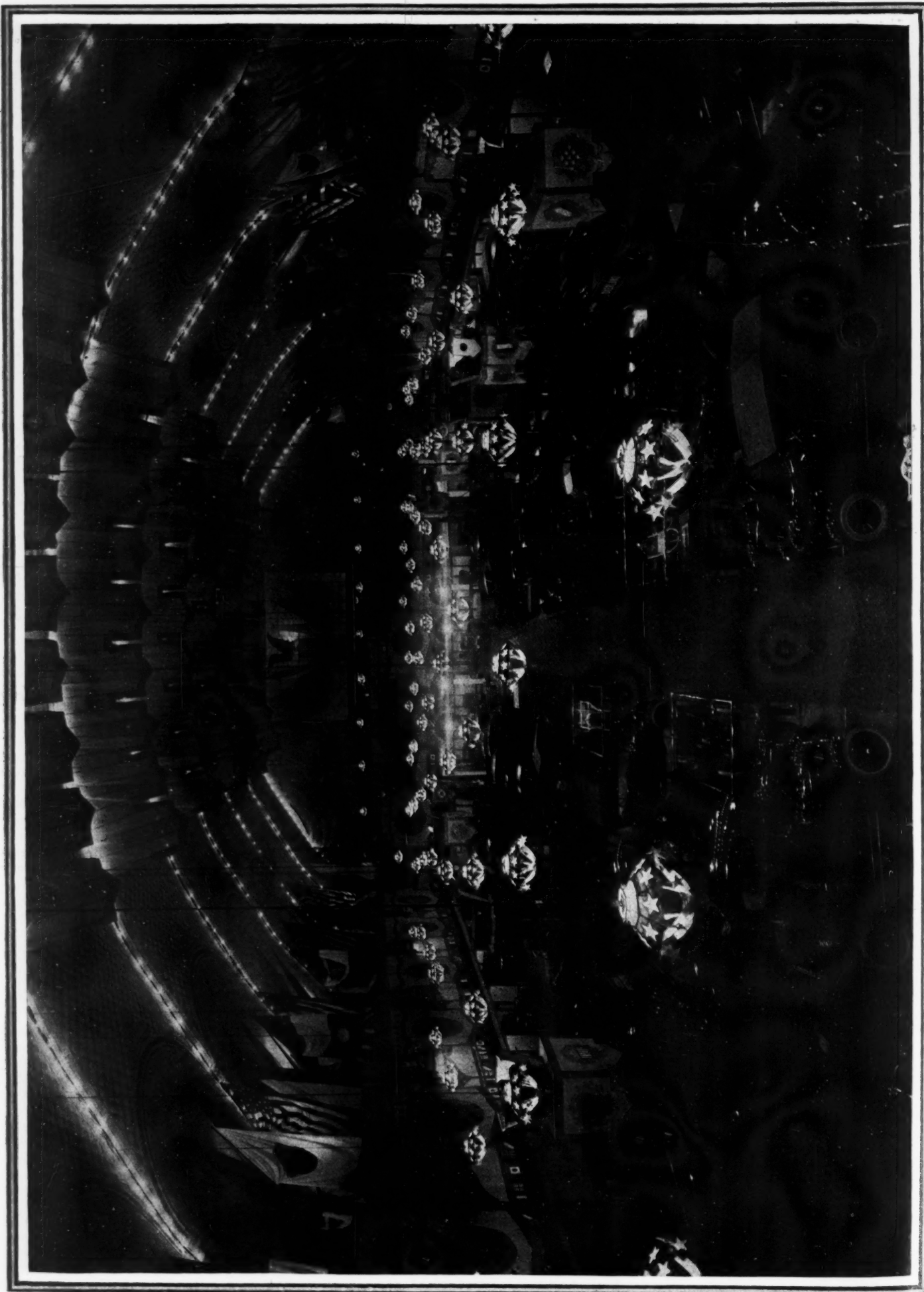
has been the case for years, certainly should overshadow the Gotham exhibition from the standpoint of business done.

The Chicago motor show was officially opened at 3:30 this afternoon by Governor Lowden, who emphasized the work that the motor industry and its allied industries have been doing in the war, and the very much greater possibilities for the utilization of motors in national transportation, both in war and peace. He mentioned the part the motor industries of Illinois had in the \$60,000,000 bond issue for good roads, and pressed strongly on the need for the carrying out of the good roads program for the betterment of transportation within the state.

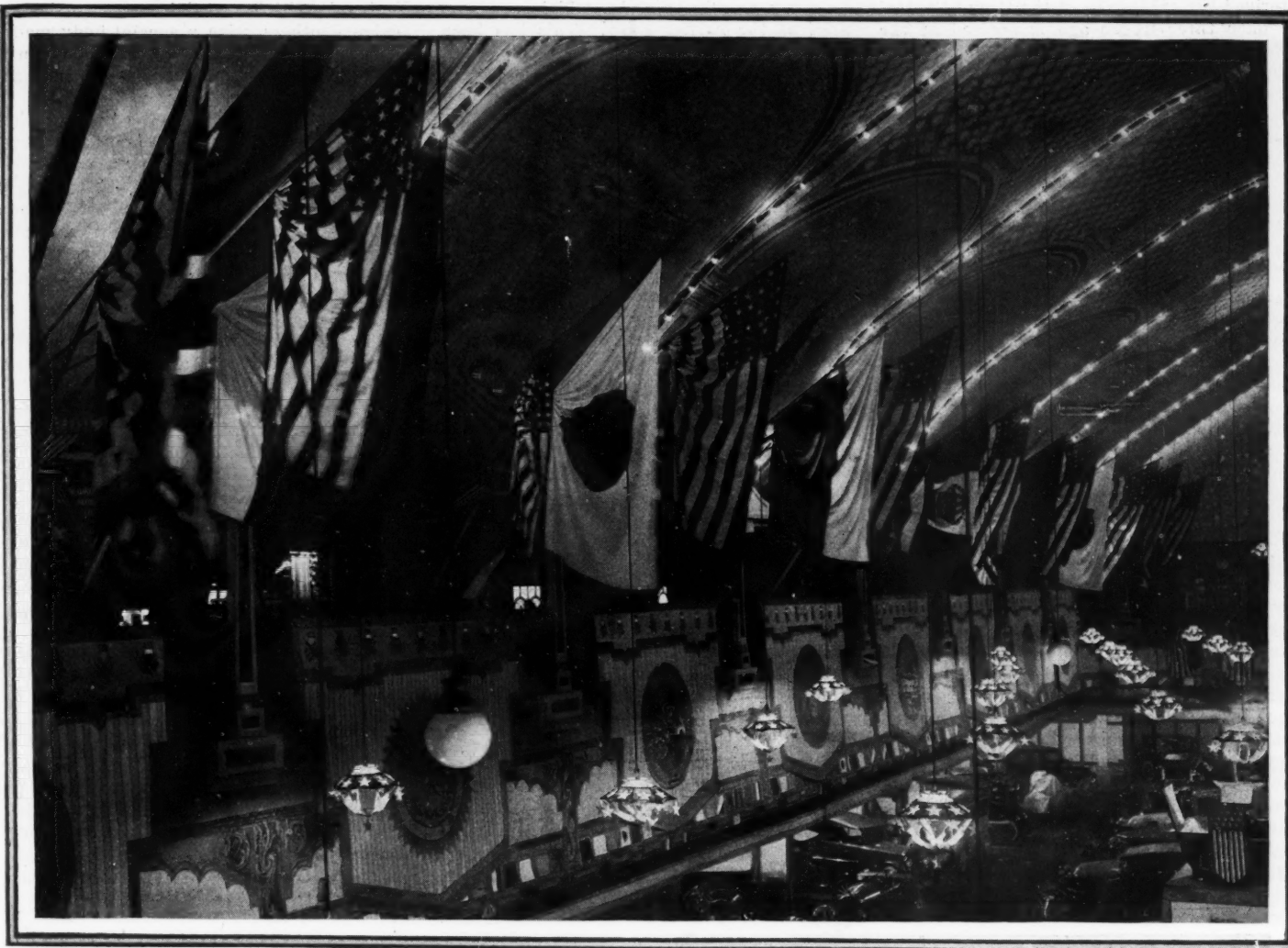
Chicago's exhibition is being watched very closely by industry as a final index of the trade prospects for the year. It is a much more accurate thermometer of trade conditions for the coming season than the New York show, because it is the time at which dealers finally close up with the manufacturers, those who have looked over the lines at New York having had an opportunity to come to a decision. Also, it is to be noted that Chicago geographically taps the great motor buying territory of the Middle West and consequently is attended by dealers in greater numbers than is the eastern one. Official figures as to today's attendance, of course, are not given out.

For the first time in the history of the ex-

CHICAGO, Jan. 26—True to form, the annual Chicago motor car show opened in the Coliseum today in a storm. This time, it was a real blizzard. But in spite of the weather conditions, the first day's attendance at the eighteenth annual national exhibition of motor cars was a very good one, and the aisles were comfortably crowded. It promises to exceed the New York show in respect of attendance and, as



Looking out over the exhibits in the eighteenth national show in Chicago from the balcony of the Coliseum. This is the main building of the exhibition



Detail of decoration in Chicago Coliseum, showing star-studded ceiling and the flags of the United States and its allies

hibition, the Coliseum will be open on only six days. Heretofore, the show has run from Saturday to Saturday, inclusive, being closed Sunday only. The Fuel Administration's order, however, for Monday closing is being lived up to by Manager Miles, and when the doors closed tonight, they were to remain so until next Tuesday morning. It is probable that had it been so desired, the exhibition could have been placed under the heading of amusements, so far as the Fuel Administration order is concerned, and thus have been permitted to remain open Monday instead of Tuesday. In spite of the fact that this would have permitted him to catch the holiday crowd, Manager Miles preferred to live up to the letter as well as the spirit of the ruling as to Monday closing.

The decorations have been detailed at length in previous issues of *MOTOR AGE*, and it is sufficient here to give a general idea of the effect and how it is obtained. The impression upon the observer, upon entering the main entrance, is of a panoply of shields and flags against a brilliantly blue sky, in which there is a marvelous abundance of white and gold stars. The ceiling of the Coliseum is a canopy of blue studded with thousands of white and gold stars, and clusters of star lights hang on a level with the balcony, and not only serve as a decorative effect, but also form part of the illumination of the exhibits

below. Ranged along the balcony are large shields from each of which spread clusters of flags of the Allies, and these are illuminated by spot lights placed upon the top of the decorative columns which serve to separate the exhibit spaces. Between these flags are placed medallions of the seals of the states in which the motor industry is important. At the entrance to the Coliseum mahogany rails are arranged to lead the visitors along either side and through the center aisle at the same time so that the crowd is spread out.

Hundreds of Service Flags

The same scheme of decoration, with such slight changes as the architecture of the buildings require, is carried out in the Annex, the Greer building and the Armory. One of the features of the decoration, which is furnished by the exhibitors themselves, is the hundreds of service flags, which are a permanent part of the display in nearly every booth. The most unusual of these is that in the Briscoe exhibit, in which a Briscoe car has been used as the service flag. It is painted with red and white stripes, and the hood is the blue field upon which are the 278 stars which represent a part of the Briscoe organization's contribution to the nation's defense.

As the first motor show in Chicago since America's entrance into the war, the Coliseum wears a distinctly wartime appearance. The whole scheme of the elab-

orate decorations is a spirit of warlike patriotism, which is carried out in the exhibits as well as the interior dressings of the Coliseum and its companion buildings.

Requirements of space made it necessary this year, as in the last few years, to employ several connected buildings. The main portion of the exhibition is in the Coliseum, with other cars shown in the Annex, a connected building, and the basement of the Annex. Other cars also are shown in the First Regiment Armory, which is a block away and connected to the other buildings by a covered passageway, flippantly known as pneumonia alley. In addition to these, the Greer building, immediately to the south of the Annex has been utilized for the display of cars by cutting through the interconnecting wall. The accessories are displayed in the galleries which surround the Coliseum in the second floor of the Annex, and in the balcony of the Armory.

In point of number of exhibitors, the Chicago show has as many car exhibitors as New York had. It has not, however, so many accessory exhibitors by over a hundred. At both Chicago and New York, seventy-nine manufacturers exhibited cars. Last year, Chicago had ninety-two cars exhibited. The present show has 146 accessory exhibitors, as against New York's 252.

The same variety of color which charac-

terized the exhibition at the Grand Central Palace three weeks ago is noticed at the Coliseum. This is a further indication that manufacturers are going to the more brilliant shades to a greater extent than in the past, because in many instances the cars on display in Chicago were not the same as those which were to be seen at New York. The manufacturers preferred to send them direct from their factories rather than risk the delay through difficulties of transportation from the Atlantic seaboard.

The color combinations are more attractive than they have been in the past. There are fewer of the black or blue-black bodies to be seen and more of the dark reds, tans, grays and lighter greens. A novelty in body painting is to be seen at the Lexington booth, in which a touring car has been given a beautiful russet shade by the use of a metallic gilt spatter-work underlay, covered by hard varnish. The paint job, of course, is a special one, but it should give an idea for the production of a body finish which would stand the weather admirably.

The straight-line effect with the pronounced beveled edge, the latter enhanced by striping which makes it still more prominent, naturally is in evidence here as in New York. There are one or two instances in which new ideas in the striping have been carried out which did not appear at the earlier show. The new Reo coupe, which makes its debut today, has the Greek key idea incorporated in the striping, in a manner which makes it particularly attractive in that style of body. Following as it does closely upon the heels of the exhibition of New York, it is not to be anticipated that there will be many new cars

or many new body styles which were not seen at the earlier show. This has been true every year, and is true this year. However, it is also true that every year there have been a few completely new cars to be seen and in addition, a number of new bodies in lines whose chassis did not carry these at Gotham.

These newer creations are described more in detail on other pages and it is sufficient here to say that among these cars which are making their season's debut at Chicago can be mentioned the Maibohm, the Pan-American, Comet, Hackett, Monitor, Moore and the Dixie. The Hackett this year is featured by a new rotary-valve engine.

Cars whose exhibits included newer styles of bodies than those shown at New York are the Auburn, with a new roadster; the Chalmers, with a new speedster; the

National, with a special town car body; Dodge Brothers, with a special body made by the local distributor; a new Reo coupe, a new Marion body and a new touring car on the Hollier Six chassis.

Two new bodies are to be seen at the Briscoe exhibit. One of these is a new convertible coupe roadster and the other an open touring sedan.

Until last week, it was feared that transportation difficulties might prevent the participation of a number of exhibitors who had reserved space, but fortunately, all but two or three succeeded in getting their entire displays in place by this morning. At least two of the exhibitors failed to get any of their cars in, and several others have had to leave them outside in the storm over night, until they could be run in tomorrow. Tuesday will see everything in place, it is believed.

Electric Cars with Gasoline Features

CHICAGO, Jan. 29—The principal features of the electric cars on exhibition at the Chicago show consist of models shown by Detroit and Milburn which are similar in appearance to gasoline cars. The Detroit is fitted with a Springfield four-passenger all-year body which opens up completely for summer driving. It is of the rear drive control type and is capable of a speed of 30 m.p.h. Detroit also is exhibiting three broughams, two of these having rear drive control and the other dual control.

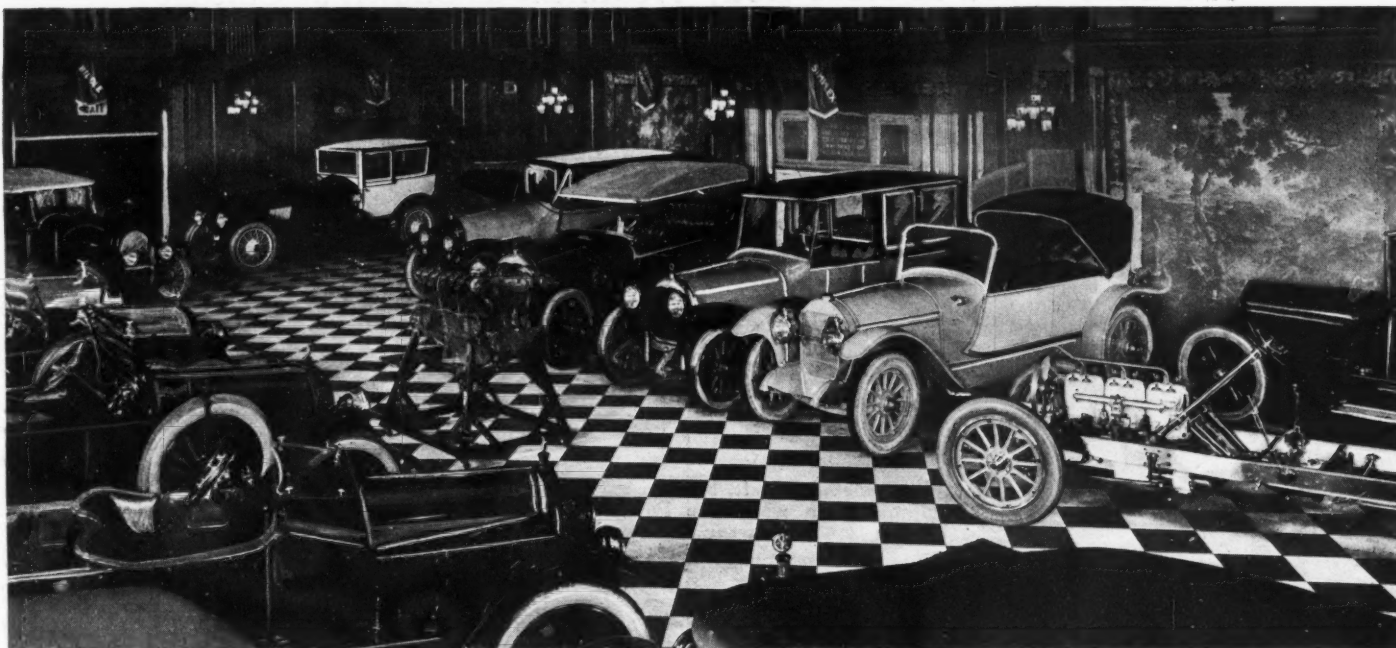
The Milburn cars of the new model comprise a five-passenger brougham and a seven-passenger limousine. These cars are

very similar to gasoline cars, in fact, the bonnet construction is very similar to that used by Packard. These cars are light weight in construction and with large battery capacity are capable of approximately 100 miles of running on one charge at the most economical speed. The maximum speed of the new model is 28 m.p.h. Milburn also is continuing the standard four-passenger brougham which is the same as last season's product.

The principal changes in the Rauch & Lang cars consist of straightening out the lines of the bodies to make them more modern while still retaining the design which has been characteristic of this car



The Chicago show overflows, and the part in the First Regiment Armory is shown here



How the aristocratic Salon appears in the Elizabethan room of the Congress hotel

for several years. Other changes consist of French pleated upholstery and a new series of color schemes. The battery capacity has been increased, giving 15 to 20 per cent more mileage than that of last year. Two five-passenger coaches with dual drive control and one four-passenger brougham with rear drive control comprise the cars on exhibition.

The Aristocracy of Motordom Exhibits

CHICAGO, Jan. 29—Have you ever looked at your little old flivver and dreamed of what you wished it looked like? With a top that didn't rattle or roar, with disk wheels, with deep soft cushions and fancy upholstery, with a Victoria top, with fancy carriage lamps, with all sorts of little doodads and kinky dinks and countless fussy little things?

Your dream may be made to come true if you go to the 1918 Chicago Automobile Salon that is now running at the Congress Hotel. And if you get about fifty little old flivvers and trade 'em in you could get a nice big Rolls-Royce with a Brooks body—for the Rolls-Royce sells for only \$14,000. It's cheap. Very cheap.

The Salon is a concentration of the aristocracy of motordom. It is a place for the poor man to look and the rich man to buy. It is as much an exhibition of art as it is of things motoring, for the designers who have worked out these creations are artists just as are those who make paintings and statuary.

Some of the exhibitors make cars so exclusive that they never make two alike. When one has been sold no other like it is ever made. Biddle has a big six-passenger touring car in aluminum finish, all ready for a white varnish or any color the buyer wishes. It is only \$3,750, but it has a victoria top and countless other earmarks of aristocracy.

Some of the cars, including jobs by Karl H. Martin, a body artist, have sound proof walls and roof, which means that when the car is running along the road there is no

The Ohio electric car is continued for this year practically the same as that of last year with the exception of a slight reduction in weight and an increase in battery capacity which has raised the speed to 28 m.p.h. The Ohio cars at the show consist of two four-passenger coupes with rear control and one five-passenger brougham with dual-drive control.

disturbing roar inside such as annoys the man who has to ride in plain every-day taxicab affairs. Of course these Martin bodies make the cars cost from \$3,950 to \$6,500, but what is a few thousand dollars if the roar can be rubbed out of one's conversation.

Speaking more seriously, the salon is one of the high spots of the industry. At the regular motor car shows folks see fine cars that are turned out at such a high rate of speed that the price can be made low. At the salon the cars are turned out on a hand-finished scale at a rate and with a care that makes the price high. But they are very good cars—all of them.

In the center of the salon is a Rolls-Royce airplane engine that was wrecked "over there" and rescued from "no man's land." It looks it, and is an object of great interest. Aside from this the exhibition includes the following:

White, four-passenger roadster, Rubay body, \$5,000; White, seven-passenger touring, Rubay body, \$5,000; White, three-passenger coupe, Rubay body, \$6,050; Cunningham, four- and six-passenger touring, Cunningham body, \$6,300; Cunningham, touring cabriolet, Cunningham body, \$6,300; Rolls-Royce, touring cabriolet, Brooks body, \$14,000; Daniels, military landau sedan, disk wheels, Daniels body, \$5,500; Daniels, four-passenger sport model, golf bag, victoria top, Daniels body, \$4,100.

Apperson, twenty-fifth anniversary model, seven-passenger touring, Apperson body, \$3,500; Biddle, Salamanca town car, Caffray body, \$4,250; Biddle, six-passen-

ger touring, Keystone body, \$3,750; Roamer, six-passenger town car, airplane deck, Martin body, \$6,500; Deering-Magnetic, sedan, Martin body, \$4,950; Deering-Magnetic, seven-passenger touring, Martin body, \$3,950.

Simplex, landaulet, Holbrook body, \$10,000; Simplex, touring, Healy body, \$9,500; Locomobile, four-passenger roadster, Rubay body, \$6,750; Locomobile, full-collapsible semi-touring, Healy body, \$8,200; Locomobile, six-fender touring coupe, Locke body, \$7,750; Locomobile, chassis, \$5,100.

DETROIT SHOW SALES \$150,000

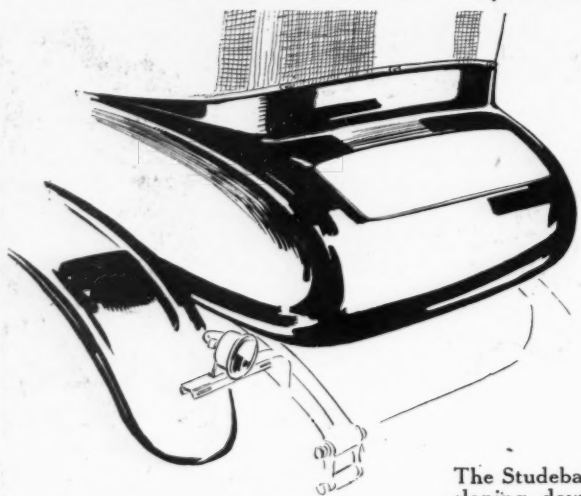
Detroit, Jan. 25—The advisability of holding a used car show as a sequel to the show which ends here to-morrow night is being discussed by the used car dealers here. An exhibition of this kind was held last summer and proved to be very successful. It has been found that the close of show always creates a supply of used cars, and taking into consideration the fact that the munition manufacture is bound to result in reduced production the dealers are looking forward to a very active used car market.

Estimates of the cars sold on the floor during the present show indicate that about \$150,000 worth of cars have been disposed of. This includes about \$50,000 worth of trucks.

TAX ON HIGH POWER!

Baltimore, Md., Jan. 26—Senator Oliver Metzgerott has introduced a bill into the Maryland legislature intended to stop the purchase of high-powered cars by placing a special tax on all making more than 35 m.p.h., which is the present lawful limit of motor speeding in Maryland. Beginning Jan. 1, 1919, all machines with a speed greater than 35 miles would pay an annual tax in excess of the regular rates of \$50 until it has reached the prohibitive rate of \$500.

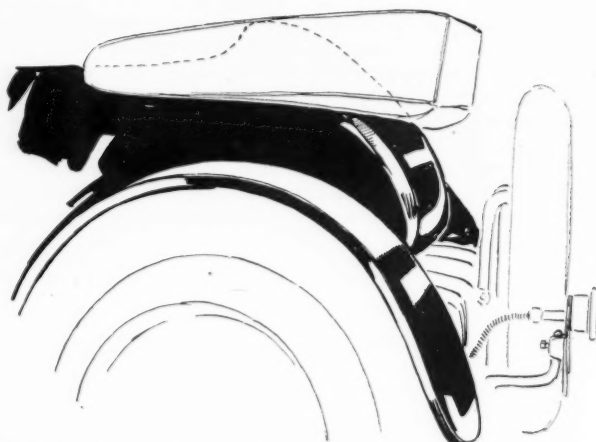
The Last Word in Rear Body Treatment as Shown at Chicago



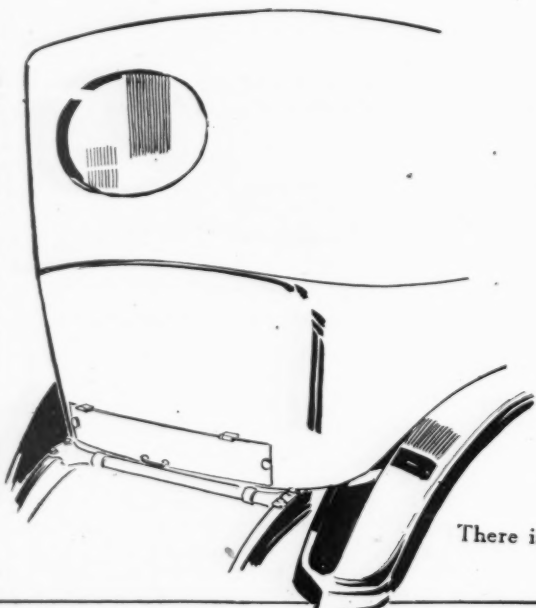
The Studebaker, left, has the rear lines sloping down while the Paige, right, has an upward sweep. Both bodies have a decided bulge



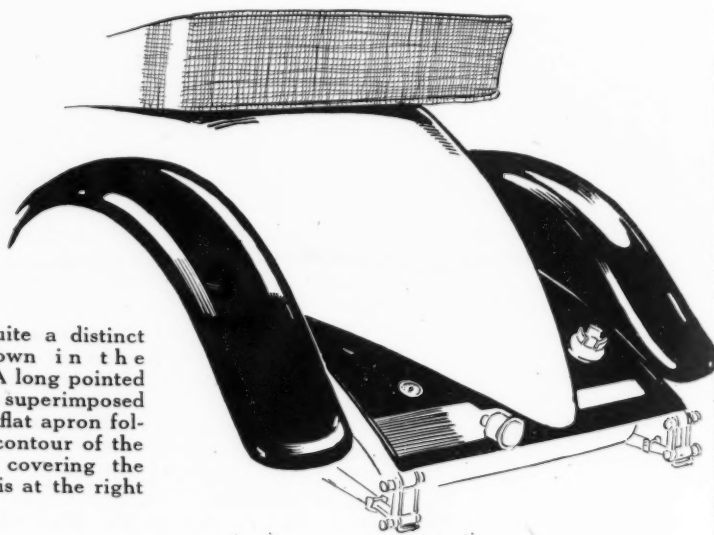
This Liberty design shows a rather unusual treatment of the ordinary roadster stern



An outgrowth of the old torpedo type is shown in this Elcar design



There is quite a distinct novelty shown in the Chalmers. A long pointed tail affair is superimposed on a broad flat apron following the contour of the frame and covering the tank. This is at the right

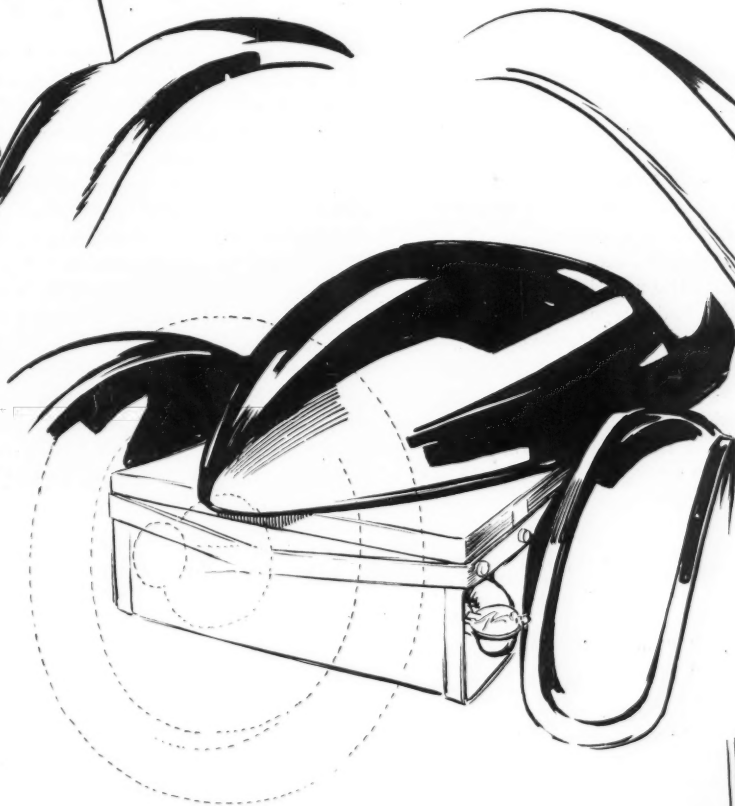


There is nothing in the way of an innovation in the design of the Milburn electric limousine but it is exceptionally clean and pleasing

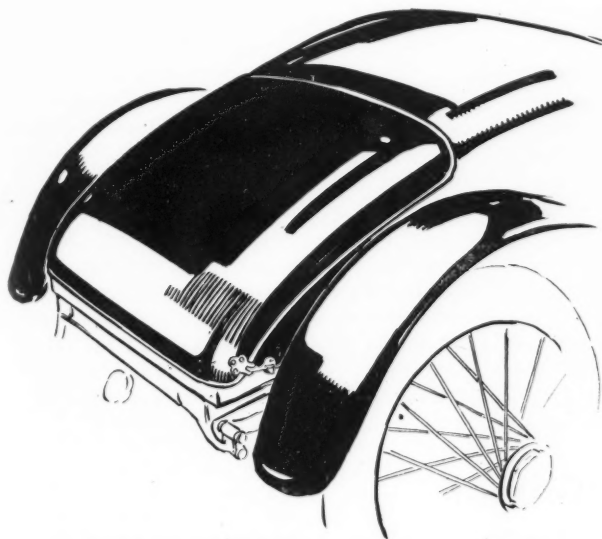
A Roamer model has a very novel rear design. A prominent bead—almost a railing—is carried entirely around the top, extending far in the rear, giving a decided back appearance



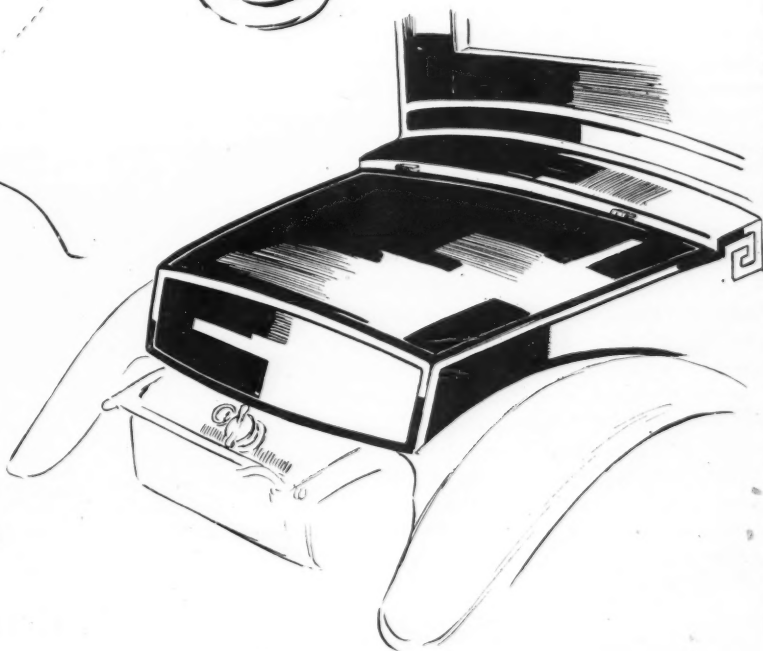
An Owen Magnetic body is composed entirely of planes—not a curved surface on it with the exception of fenders. Even the radiator cap and door handles carry out the angular idea



A National racer type appealed to the racing fans. Its long tapering rear deck was exceedingly rakish



In the same class with the National was a Peerless speedster which utilized its rear deck for tire and luggage



A very pleasing Reo body had this interesting termination—square heads with Greek fret terminals numerous

failed. It soon was decided that it was an impossibility to make up a list of the so-called non-essentials. The matter was dropped; in fact, the Council of National Defense issued an official statement in which it was quite explicitly stated that there was no such thing as a non-essential in the industrial world, but rather that all industries were essential.

LAST week a new attempt at the same objective, namely, curtailing certain industries, was set on foot. This time the movement has originated through the Fuel Administration, and coal seems to be the determining factor. When the fuel order originally closed all industries to clear up congestion, much of which was due to eastern railroads being overcrowded with tens of thousands of cars loaded with freight that could not be unloaded at tidewater, much of this Government freight, it gave a new opportunity and a new method of approach with regard to industries that many in governmental Washington cannot see as directly coupled with the war. It was a relatively easy matter after clamping the coal lid down tight on all industries to raise it just as desired. First exemptions to war orders were given, and then the exemption list was added to as demands arose.

IT is just at this step that the motor industry again has been asked to establish its right to existence as a useful factor in the prosecution of the war. Last week representatives of the motor car industry and also the parts and accessory industries held conferences with the Fuel Administrator and did much to convince him that the motor industry is a war essential, and today it seems that our biggest men from the industries have made an impression on Doctor Garfield—at least he has asked

for a ten-day consideration of the question at the end of which time a meeting will be held and the conference resumed.

IT is unfortunate at these days when our troops have been, as reported, not getting enough supplies due to a breakdown in transportation that some of our Government departments should still be working to interfere with the development of transportation. Supreme efforts must be made to get official Washington set right on what are prime requisites in transportation. As yet, the Fuel Administration fails to see the motor car in the actual role it is filling in our vast agricultural sections as well as in our thousands of towns and cities. The farmer must have the motor car; he will be compelled to buy motor trucks and, as for the farm tractor, the demands of war for more grain make it necessary to secure tractors as fast as it is possible to manufacture them.

THE same short-sightedness that led the Government to prohibit the shipment of road-building materials is now attempting to stifle a national necessity, a prime essential in transportation. The snow storms of the Middle West have given an opportunity for the motor truck to save the situation as it was never thought possible to do. In large centers like Chicago it is a prime war essential. The Government error of shutting down on the shipping by railroads of road-building material but indicates the danger of men not sufficiently familiar with the industrial demands in war time. We must have road materials and we must build roads. The Government departments must learn that road materials are great essentials in war days, and they must also learn that the vehicles that use these roads are prime essentials in war days.

Motor Conditions in Japan Prosper

Country Purchases More Large and Expensive Types of Cars

NEW YORK, Jan. 25—Motor car conditions in Japan are prosperous and the country is purchasing more large and expensive cars in addition to a good supply of cheap cars than it has ever done in its history, according to Tom O. Jones, who has just returned from an eight months' trip through the East in the service of the Bureau of Foreign and Domestic Commerce. Mr. Jones says there are 2400 cars in Japan and during the first nine months of last year 600 were imported as compared with 218 during the twelve months of 1916.

Road conditions are not favorable in Japan for motoring, as they are generally too narrow with weak bridges, many bridges not being wide enough to accommodate a motor car and not strong enough to carry the lightest car. Prospects for improvement are ahead due to the government spending \$2,000,000 on the road from Tokio to Yokohama, as well as ordering other provinces to improve their roads. This government action has been due to the purchase by the government of motor trucks, which cannot be efficiently used without adequate roads.

Mr. Jones in speaking to the export committee of the National Automobile Chamber of Commerce, gave a side light on Japanese truck activity by stating that recently some Japanese army engineers brought an American truck from China with the hope of copying it at the government arsenal, but so much engine trouble followed that the idea of building trucks

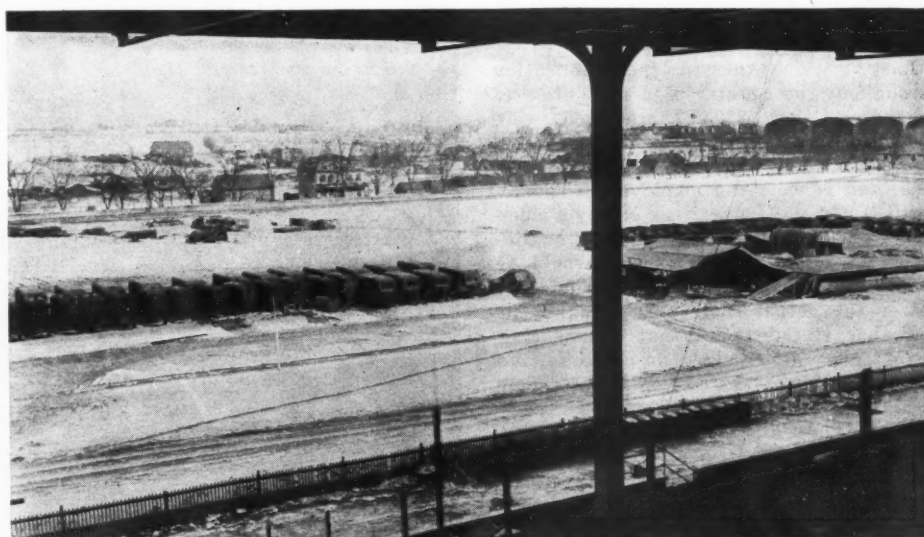
by the government of Japan was given up.

In his trip through the East Mr. Jones made investigations in China, where there is some hesitation in buying cars, due to the fear of the machines being taken from them.

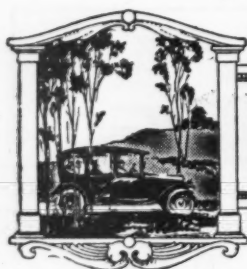
LYONS FAIR BEING PLANNED

Paris, France, Jan. 22—The third annual Lyons Fair will be held this year on March 1 to 15. The first two fairs were held in

1916 and 1917 in the full tide of war. No American concern was represented at the first show, while in 1917 thirty-three concerns displayed their wares in response to an extensive publicity campaign. The fair is strictly a commercial proposition, not merely an exhibition. The booths are permanent structures and so arranged that the exhibitor may have a showroom and salesroom. No goods can be sold at retail, orders being booked in wholesale quantities from samples displayed. The fair offers opportunity for concentrated sales effort to those desiring to extend their market and offers a patriotic opportunity for Americans to place American business on its proper footing. Full particulars can be had from George B. Van Cleve, 1790 Broadway, New York.



Many ambulance units receive final training at the Allentown camp. This view was photographed from the old racetrack grandstand which overlooks the camp



EDITORIAL PERSPECTIVES



Our National Show

CHICAGO'S annual motor car show is not far enough along to be judged how influential it is to be as a war show and to draw accurate conclusions as to the value of motor car shows in war days. The attendance was such on Saturday, the opening day, in spite of a typical Chicago snow blizzard, that the motor car is an institution rather than a mere passing form of entertainment. The attendance, not the usual paper attendance of first nights, gave indication that there are great numbers of persons deeply interested in cars of all classes and prices. The exhibitors in most cases never expect to make many sales from a Chicago or New York show, but the inquiries regarding cars were as good on the opening night of the first war show as they have been on the opening night of any previous show. The crowds demonstrated that the purchasing of motor cars is not going to cease with our active entry into the war, but rather they gave indication that as we get deeper and deeper into the war and as we have fewer men at home to do the work, it is essential that those remaining multiply their working capacity, that they add to their hours of usefulness and that they take all steps that lead to a greater volume of accomplishment. The crowds proved that the motor car is considered one of those factors that add to the working capacity of a man. The motor car not only adds more hours to the working day of the doctor and permits him to

accomplish more with greater ease, but it adds to the daily mileage of the salesman, it adds to the mental efficiency of the professional man, in short, it is a prime war essential.

THE annual Chicago motor car show for many years has been a national institution. It brings to Chicago the record crowd of any week of the year. It is fortunate in these days when higher ability is demanded from every man and woman in the country, that this great means of transportation should be the magnet that brings so many hundreds of thousands together into the great population center of the Middle West. The present war has been analyzed as being 80 per cent industry, 15 per cent transportation and 5 per cent men. Chicago is the greatest retail and distributing motor car center in the world; it is perhaps the greatest radiating center of railroad lines in the world; some day it should be the greatest radiating center for an improved system of highways in the world; and with such a setting it has premier right to any institutional motor car demonstration such as the present show, which previous to the war gave evidence of its international value and which after the war will undoubtedly prove to be the great motor car exhibition center of the world.

American Cars in B. S. A.

THE American motor car is a logical machine for the South African farmer in that the veldt—pronounced felt—or country, resembles the American prairie in many respects. This veldt is without improved highways, and is a land of great distances and sparse population and is thus a particularly appealing field for the motor car. Previous to the war Europe largely dominated the African market, but since European countries have been out of export trade, the sale of American cars and accessories has increased greatly. Many makes of American cars are giving a good account of themselves in the Union of South Africa, which comprises four countries, namely, Transvaal, Orange Free State, Natal and Cape Colony.

THE type of car needed in South Africa is practically the same as that needed in our Mississippi valley, in Argentina, in Australia, or other great agricultural areas where distances should be measured by leagues instead of miles and where population is hopelessly sparse. To the Boer or farmer of the veldt the car is a prime necessity, and while these people are not mechanical, they are certain to be great users of cars in the near future. At present they are buying American cars in large quantities notwithstanding the fact that the price is practically double that paid in America, with the price of gasoline over \$1 a gallon. The general expense of operating a car in other respects is nearly double that in America.

IN such a country as the Union of South Africa, the touring car with great passenger capacity is the natural vehicle. There is little demand for the runabout and scarcely any for the sedan or other luxury types. The development of the commercial vehicle scarcely has commenced. Quite some progress has been made with electrics, as they are proving cheaper than gasoline vehicles, notwithstanding the limited battery mileage. Already plans are being made to sell trucks without batteries and furnish electric current on a service basis. The present war is further demonstrating that American farm tractors will have a good field in South Africa.

IN these days when the world is getting smaller instead of larger and when the war is bringing all nations side by side in the common struggle for democracy, South Africa is playing its part on the side of democracy and is destined to be one of those countries that will make great strides in the next few years. Although it is not so great to-day as a potential market, it is one that should be studied carefully. Unfortunately many of our manufacturers have not grasped the magnitude of the country or the problems it faces, and readers of MOTOR AGE are urged to read the series of articles on this country beginning in last issue. These articles are written by a South African, a native of Johannesburg and one who has spent practically all of his life in that country.

Our Essential Industry

ONCE again, part of official Washington is looking around to see if it cannot affix the label of non-essential to the motor car business, but this time the effort is being made along new lines. The first spasm of non-essential talk regarding

industries started spreading from Washington the end of October. Then the plan seems to have been in the minds of a few that it was possible to make a list of those industries that certain Washington people considered non-essential to the war. That plan

ten qualifies for this service, the high skilled mechanics from this vicinity are qualifying at the rate of nine out of every ten. There are 450 men being recruited from Detroit and vicinity to act as engineers in the non-flying section of the Aviation Corps, and to speed up the program. These men must be either gasoline engine experts or have a collegiate training in the mechanical, electrical or mining courses. Those selected will be given seven weeks of intensive work at Massachusetts Institution of Technology. About half of the 450 prospective officers have been obtained.

OLDS IN TRACTOR COMPANY

St. Louis, Mo., Jan. 28—R. E. Olds, after spending several days in the offices of the Kardell Tractor & Truck Co., here, let it be known that he had become associated with this company. The plans then announced are for three factories, one in St. Louis, one in Lansing, Mich., and one in Oldsmar, Fla. Further details of the extent of these factories will be made public later. Work has started on the factory at Oldsmar.

The company now is manufacturing tractors at the St. Louis Car Co., here. The Kardells, who invented and control the tractor, have long been agents here for the Reo cars. The company now has a capital of \$1,000,000.

PASSENGER CAR IS NECESSITY

Detroit, Jan. 25—More than 80 per cent of the passenger cars in America are indispensable to business, according to data gathered in a nation-wide investigation just completed by the Haynes Automobile Co., Kokomo, Ind. A letter asking for complete information regarding the individual's use of his passenger car was mailed to 1000 owners living in all states. Manufacturers, jobbers, farmers, buyers, salesmen, physicians, attorneys, contractors, hotelkeepers, executives, according to the replies received, are representative of the businesses which find the passenger car a necessity. Of the less than 20 per cent who do not hold their cars as necessary to the conduct of business, many say that without them their efficiency would be reduced greatly.

114 DETROIT MAKERS EXEMPTED

Detroit, Jan. 28—One hundred and thirty-four factories in Michigan have been granted exemption from the Monday closing law rule. These exemptions are granted for the department engaged in the manufacture of materials for the Government, either for the War Department, the Navy or the Ordnance Department. In addition to being exempted from the closing orders, these plants are given preferred priority for coal shipments and outrank other manufacturers in this line, although this coal must only be used for the Government work.

A general order also covers all airplane manufacturing plants, all shipyards and the manufacture of explosives of all kinds. Coal to relieve the situation and particularly to prevent delay in Government work is on its way to the interior of the state. This is coming over all lines of railroad and indicates that it is passing the blockaded gateways.

Effect of Five-Day Close on Industry

Freight Embargoes Close Shipments by Railroad and Snow Checks Driveaways

DETROIT, Jan. 26—The net result of the five-day shutdown in Detroit was the diversion to domestic users of 105 cars of coal. In spite of this fact, unfilled domestic orders are 60 per cent more today than they were at the beginning of the shutdown period. Besides this no headway has been made toward opening free passage for empty coal cars over the roads south of Toledo, and all indications point towards a continuance and even an intensifying of the existing shortage. The daily average of coal for the five fuel holidays arriving in Detroit was 563 cars. This is about equal to normal conditions and showed that the shutdown did not increase coal receipts as expected. Eighty per cent of coal coming through the Toledo gateway is consumed in Detroit, the remainder going to other sections of Michigan, so that all sections suffered proportionately. The need of the city is 700 cars daily, so that receipts have been 36 per cent below requirements. The Detroit Edison Co., which furnishes most of the plants with power, reported a saving of 40 per cent, or 850 tons, Monday, as compared with normal days.

The Flint situation is very serious. With plenty of orders on hand it is absolutely impossible for the companies to move any cars. The freight embargoes have closed all the gateways to the east and the snow has stopped driveaways for the time being. Some of the factories had crews trying to clear roads through to the Chicago connecting links, but these had to stop on account of the impossible conditions and severe cold weather.

Severe snow falls have stopped driveaways from Lansing. It is now impossible to drive through to Chicago or Grand Rapids, although the roads are passable to Detroit and thence to Toledo. The Olds Motor Works have enough orders on hand to run the plant to capacity during the winter months, but due to the fact that deliveries cannot be made, the business has had to be held over until the severe conditions have passed. Cars have been driven by the Olds to such points as Chicago, Toledo, Grand Rapids, and Michigan City, where it is possible to get freight cars, and from these points they are shipped to their final destination. For delivery, cars are driven as far as St. Louis

and Boston, and very probably during this coming summer will be driven farther. The coal situation is very bad in Lansing, as it is in Flint.

The Holt Mfg. Co., Peoria, Ill., which is engaged in the manufacture of caterpillar tractors for the armies abroad, was exempted from closing to save fuel, but the Avery company of the same city, which is manufacturing only farm tractors, was forced to close. The manager of the latter concern was informed that if he was given exemption, that all of the agricultural implements plants would insist upon the same privilege.

NO BAD EFFECT IN MILWAUKEE

Milwaukee, Wis., Jan. 28—Owners of garages and repair shops at Milwaukee have been much relieved to learn from the United States Fuel Administration that such places of business and industry have been exempted from the heatless Monday coal-saving order and may remain open as usual on the coming nine Mondays. In the absence of more definite advices, practically every garage, repairshop and service station in Milwaukee was closed from Jan. 18 to 23, the five-day period prescribed for manufacturing plants. Public garages remained open, but only to permit owners of cars to call for and deliver their vehicles, the shops being shut down. Truck service stations made only the most urgent repairs and adjustments. On the night of Jan. 23, however, information was received that the coal-saving order contains nothing to prevent the operation of motor vehicles of all classes, being under the head of public utilities, and in keeping with this ruling, garages were exempted. No serious consequences resulted from the voluntary closing in Milwaukee, as the operation of cars for the most part was difficult because of snow blockades and only a relatively small percentage of vehicles was kept in continuous service during the greater part of the period.

JOY TO RESIGN FROM L. H.

Detroit, Jan. 26—Henry B. Joy will retire from the presidency of the Lincoln Highway Association, and it is said that F. A. Seiberling is slated for the presidency. A meeting will be held Saturday at which will be discussed the advisability of continuing road work in Utah and Nevada, for which F. A. Seiberling contributed \$100,000, John N. Willys \$50,000 and Carl Fisher \$25,000.

LOSSES FROM CAR THEFTS

Detroit, Jan. 26—Figures gathered by the Detroit Automobile Club show \$8,316,666 was lost through car thefts in 1917. Careful checking of figures from all parts of the country show that between Jan. 1 and Oct. 1, 1917, in fifty of the largest cities of the United States, 22,750 motor cars were stolen, and of 8000 no trace has ever been found. Figuring the average cost of these at \$450 per car, the total value of

Service Is Exempted

WASHINGTON, Jan. 25—The U. S. Fuel Administration has issued a statement to the effect that there is nothing in the order of Jan. 17 which called for the maintenance of heatless days, to prevent the operation of motor cars, motor vehicles of all classes being considered as coming under the head of public utilities. In keeping with this ruling, garages have been exempted also. This statement clarifies the situation and was made particularly in regard to the use of trucks operated in the movement in freight and general supplies.

New Motor Problems Arise at Capital

Fuel Administrator Meets Industry with Idea of Curtailment—Committee Appointed

WASHINGTON, Jan. 28—Special Telegram—Washington is alive with events vital to the automotive industry this week. Fuel, labor, standardized use of Liberty trucks and other important problems have arisen. The chief event of the week was the meeting Thursday of the Fuel Administration with representation of 90 per cent of motor car production. Doctor Garfield came to this meeting with the firm purpose of directing the immediate curtailment of 25 per cent of the use of coal with further plans for additional curtailment, the basis to be determined by essentialness of industry. He learned, as he himself stated at the meeting, that the automotive industry is really one that cannot be classed with any other in the country, that it already is engaged in almost a \$1,000,000,000 worth of war work outside of manufacturing passenger cars and trucks for the Government, and that since it contemplates taking on considerable more war work, it must keep its organization intact. This, he conceded, could not be done if the industry had to curtail present activities. In view of the fact that the industry already is curtailed 30 per cent by business conditions, he suggested that the matter be given consideration for several days and that the committee appointed last Thursday make new recommendations at the coming meeting.

Personnel of Committee

The committee is composed of John F. Dodge, W. C. Durant, Chairman, John N. Willys, C. C. Hanch, C. H. Pelton, and the members of the Automobile Industries Committee, which will meet in ten days to again take up the problem with the Fuel Administration.

It is likely that the committee will recommend curtailment of the coal allowance for the entire industry of 5 or 10 per cent. This curtailment can be overcome by use of substitutes and more efficient methods, and it is thought most diplomatic and wise by members of the industry in Washington that some slight curtailment, such as the one suggested, be recommended.

Last week witnessed the publication throughout the country of a news item to the effect that 250,000 workmen were needed immediately for the shipyards. This created another labor shortage hysteria and is worrying employers. The report is untrue. It was given out by a member of the Shipping Board without qualification that this number of men would be needed in the future, which would be nearer the actual fact. The Department of Labor stated today that commencing in the spring it will have to make a drive for shipyard workers. It anticipates now that about 360,000 workers will be needed by Aug. 1, of which 220,000 will be skilled and semi-skilled. It plans to utilize the public service reserve to enroll these workers voluntarily in the meantime. By this method it will know where to locate the men required and employers will know which men they are likely to lose. The

present hysteria about labor shortage is caused in the main by various shipyards throughout the country, which anticipate that they will have to break contracts with the Government owing to the slowness in erecting plants and securing material and which hope by their demands for workers to later have an alibi for the broken contracts. Philadelphia shipyards, for example, are calling for 7,000 men, and the Department of Labor states it could not really at this time place twenty men.

The Department of Labor stated today that it could not even place 15,000 skilled and unskilled workers in all shipyards of the Nation at this time, much less 25,000.

A most important decision by the Department of Labor today was to the effect that it does not expect to take any important number of workers from the motor car makers but anticipates it will draw the kind of machinists and other skilled workers it requires from the repair and garage industry. Figures on hand now show that about 31,000 inside machinists and 18,000 outside machinists will be required by Aug. 1 by shipyards. Half of these, or about 19,000 men, the Department of Labor hopes to secure from the repair shops and garages. It realizes that with the exception of a very few workers in manufacturing plants, such as toolmakers, that there are few all-round machinists that it could use in shipbuilding.

The general staff of the War Department recently has made a very important and interesting decision to the effect that all departments of the War Department must use only Class B and Class C and Class AA standardized war trucks after July 1. This means standardized use of standardized trucks. It eliminates the present system whereby each corps or division has its

own kind of trucks together with separate maintenance establishments, separate armies of repairmen, separate stock of repair parts. It is a movement toward actual co-ordination of this branch of service.

The appointment of E. R. Stettinius as surveyor general of supplies for the Army will not for the present at least have any effect on the motor transportation headed by Christian Grl. Mr. Stettinius will work to supervise and co-ordinate procurement of material acquisition by purchase or otherwise of all supplies and munitions required by the Army. It will be the duty of heads of different bureaus, including, for example, General Chauncey D. Baker, head of the transportation department, which includes the motor transport section, to keep Mr. Stettinius informed of the condition of purchases in the process of manufacture.

The Signal Corps soon will make a drive for recruits for the non-flying service. The recruiting division, which has been under Major Steever, is now under Major Litchfield. Major Steever's complete organization was transferred with him. Major Litchfield anticipates the beginning of the new drive to be aided by widespread publicity within the next three weeks.

The Federal Reserve Board has taken steps toward limitation of so-called non-essential enterprises by appointment of a committee of three bankers who will pass on capital issues, applications for which will have to be made by all private companies for duration of war. Temporarily this committee will not pass on individual securities issued aggregating less than \$500,000 in the case of industrial or public utility corporation.

DETROIT RECRUITS RANK HIGH

Detroit, Jan. 28—A high percentage of applicants from this city for the air service is qualifying. Capt. W. R. Wren, president of the U. S. Aviation Board at Washington, D. C., has just completed several days of investigation here. It was found that while in other cities one out of every



A tank brings in a captured German gun under the protection of camouflage during the Cambrai drive. This is one of Byng's big tanks

lost property would be \$3,600,000. The 8000 cars represent at least 4 per cent of the total number of cars manufactured in 1916. Though this is not a large percentage the aggregate is considerable as the following table shows:

Cars stolen, 22,750	
Unrecovered cars, 8,000, valued at..	\$3,600,000
Estimated damage to 14,500 recovered cars at \$75 each.....	1,087,500
Estimated rewards for recovery of 14,500 cars at \$50 each.....	725,000
Estimated expense from public treasury in recovery of 14,500 cars at \$50 each	725,000
Estimated cost of maintenance of bureaus in salaries and expense in obtaining evidence, etc.....	100,000
Total	\$6,237,500

These statistics are from only fifty of the largest cities in the United States. There are at least 125 cities more whose population is between 25,000 and 100,000 and which can well be taken into consideration. As records have recently shown an alarming loss by theft, these losses may well be considered, as their total population is a little over a third. Estimating their total as a third and beginning from that basis, it would make a total of \$2,079,166 loss for these 125 cities, which would bring a grand total on account of motor car theft to \$8,316,666. The effect of this already has been felt in insurance rates.

CHICAGO'S USED CAR SHOW

Chicago, Jan. 25—The Second Annual Great Central Market Used Automobile and Truck Show will be held in the Coliseum here March 30 to April 7 under the auspices of the Chicago Automobile Trade Association. In 1917 the used car show resulted in the following sales: 369 passenger cars, total value, \$275,825.40; truck units, commercial car and accessory, \$52, \$52,000.

Lyons to Paris by Truck

French Army Helps Relieve Freight Shortage by Hauling Private Goods

Other Foreign Cities Using American Vehicles for This

THE inauguration of motor truck routes between the principal cities of this country, as reported in MOTOR AGE, is along the same lines as a similar service in France but with the difference that the army is back of the use of trucks for short hauls there. The French army transport service has undertaken the haulage of privately-owned goods under certain circumstances to help relieve the shortage of freight.

Lyons, 300 miles southeast of Paris receives many trucks and cars from the Lyons and Italian factories and has to equip these vehicles and send them out to the front or to the neighborhood of the capital. It is now the general plan to send these truck convoys to Paris by road and to accept general freight for them. The public is informed from one to two weeks in advance of the departure of a convoy, the available tonnage and the date of reception of the goods to be hauled. The price charged is 6 cents a kilometer-ton, packages not to exceed 141 cu. ft. each, and load to be not less than half a ton for any one destination or consignee. Goods are accepted for three towns en route, Chalon-sur-Saone, Auxere and Fontainebleau. On reaching Paris the trucks go direct to the state aviation factory, where goods are unloaded. They must be called

for at this place by the persons to whom they are consigned.

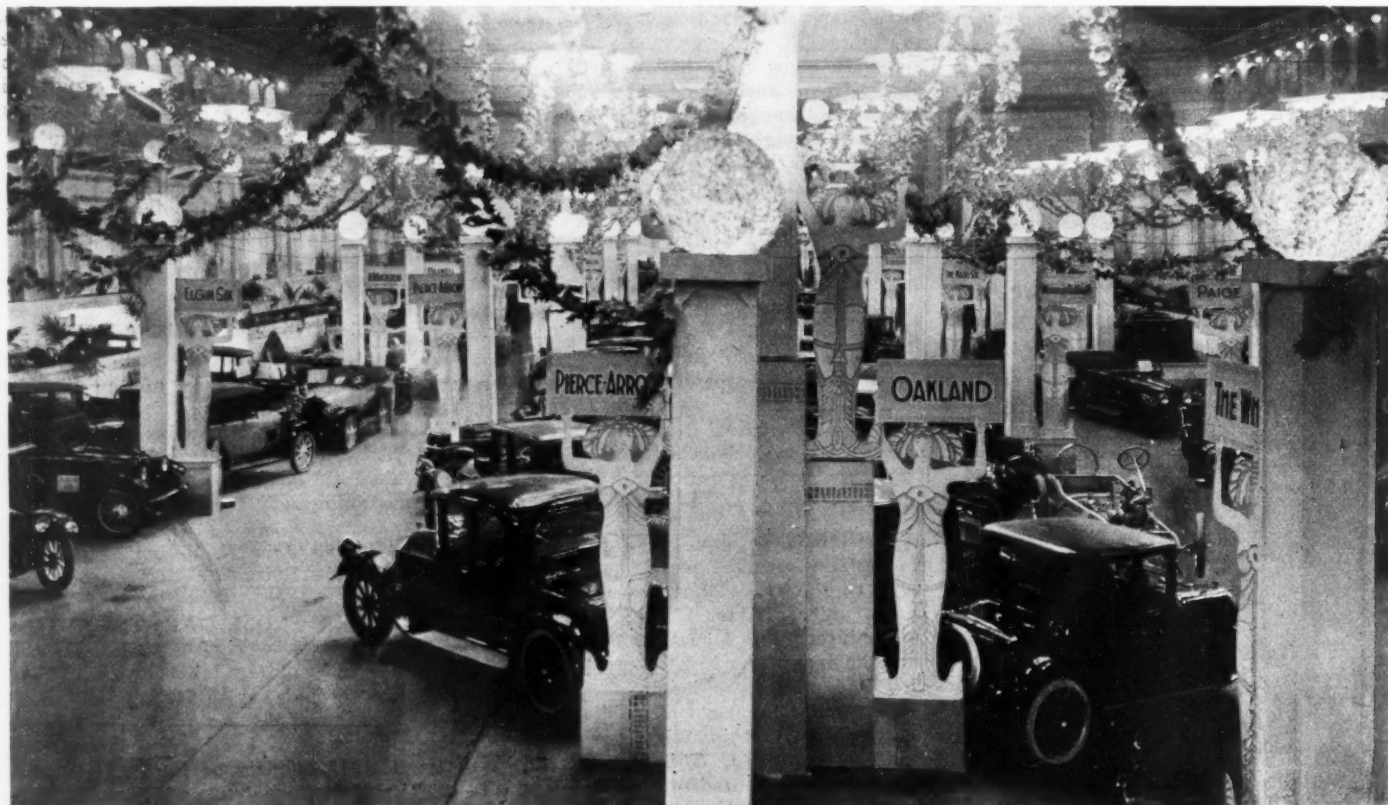
A similar system of public haulage by army trucks has been in force for some time between Havre and Paris and St. Nazaire and Paris, the respective distances being 120 and 250 miles. American trucks are used for this work. Formerly all these trucks were brought up by rail, then by road empty, for the army rarely had any freight to give them. By accepting commercial freight the railroads are relieved and good are brought up with the least possible delay.

WILMINGTON SHOW SELLS CARS

Wilmington, Del., Jan. 28—With an aggregate attendance of 60,000 and twenty-two car sales, besides a lot of good prospects, the twenty-one motor car dealers and eight accessory houses which exhibited at the fourth annual Wilmington show, which closed at the Hotel duPont Saturday night, believe the \$1,200 which they invested to meet the expenses was money well spent. Because this show is held in the spacious lobby and main dining room of the hotel, no admission is charged and the expense has to be borne by the exhibitors. This is considered well worth while.

80,000 AT MILWAUKEE SHOW

Milwaukee, Wis., Jan. 26—The results of the tenth annual Milwaukee show were much more favorable than had been anticipated in view of the conditions. It is difficult to draw comparisons with any degree of accuracy between the 1918 and the 1917 shows. This year the exposition was held in two sections. The first seven days were devoted to passenger cars and accessories exclusively, the last three days to



General view of 1918 exhibition at Milwaukee, Wis., which was attended by 80,000 persons

commercial cars, tractors, trailers, road locomotives, and commercial vehicle supplies and accessories. The Garfield fuel order interfered with the passenger car section to the extent of keeping it closed on Monday. Consequently the remainder of the show was advanced one day, and the commercial car section did not open until Thursday morning, instead of Wednesday, as originally scheduled.

The total attendance for the ten days was approximately 80,000 compared with 70,259 admissions at the seven-day combination show held in January, 1917.

BALTIMORE ATTENDANCE DROPS

Baltimore, Md., Jan. 26—Baltimore will be able to sell all the motor cars she will be able to bring into her territory was the verdict of the majority of the dealers at the 1918 Automobile Show held in the Fifth Regiment Armory for five days came to a close to-night. It was the twelfth annual show held under the auspices of the Baltimore Automobile Dealers' Association and the Automobile Club of Maryland. In point of attendance it was way below last year, only 25,000 attending compared with over 40,000 in 1917. What was lacking in numbers was made up by more interested visitors and buying was better than last year.

DETROIT HOLDS 17TH SHOW

Detroit, Jan. 25—Detroit's seventeenth annual show in many respects is the best ever held here. It is being held in the new Overland building, and three stories are being used for displays of cars, trucks and accessories. Fifty of the 100 exhibitors are showing cars; twenty, trucks; and thirty, accessories. In all 230 cars are on exhibit. The show is held under the auspices of the dealers' association. The building has been decorated in a Roman garden effect, with flowers and huge vases against a background of antique walls. The passenger cars are on the two upper floors with the accessories and commercial vehicles on the first floor.

DEALERS LIST CHICAGO MEETINGS

Chicago, Jan. 26—The Chicago show is more prolific in dealers' meetings and dinners than the New York show was, the following having been scheduled to date. Probably others will be arranged before the week is over.

Chicago Automobile Trade Association luncheon, addressed by E. LeRoy Pelletier, Lexington Hotel, Jan. 26.
Cole Motors Co., luncheon, Congress, Jan. 30.
Franklin Automobile Co., luncheon, Congress, Jan. 30.
Elgin Motor Car (Dealers) luncheon, Sherman, Jan. 30.
Elgin Motor Car (Parts Mfrs.) luncheon, Sherman, Jan. 30.
Illinois Oldsmobile Co., luncheon, Congress, Jan. 30.
Velle Motors Co., luncheon, Sherman, Jan. 30.
Dodge Brothers, luncheon, Blackstone, Jan. 30.
American Truck & Airplane Co., banquet, Morrison, Jan. 30.
Nash distributors, banquet, Sherman, Jan. 30.
Reo Motors Co., luncheon, Congress, Jan. 31.
Paige-Detroit Motor Car Co., luncheon, Congress, Jan. 31.
Harry Newman-Stratton Co., luncheon, Congress, Jan. 31.
Hupp Motor Car Co., luncheon, Blackstone, Jan. 31.
S. A. E. War Dinner, Morrison, Feb. 1.
Federal Export Corp., headquarters, Congress, Jan. 26-Feb. 2.

U. S. Will Control Gas

Governmental Action Will Not Affect Use of Fuel for Motor Cars

To Rush Supplies to Industries for War Needs

WASHINGTON, Jan. 29—Special telegram—President Wilson will issue a proclamation in two weeks taking control of fuel, oil and gasoline. The action is considered imperative to rush these supplies to war industries that need them most. No restriction will be placed on the use of gasoline for motor cars, it is stated, because there is no shortage of gasoline. Mark L. Requa, newly appointed oil director, will have charge and will transport oil and gasoline to those industries in greatest need and shut off those who do not require it so urgently.

PACKARD TO INCREASE PRICES

Detroit, Jan. 26—Beginning March 1, the Packard Motor Car Co. will increase prices on all the 3-35 models \$200 and the 3-25 models \$250. The change is in the chassis only, all styles of bodies advancing the same amount. The prices follow:

MODEL 3-25	NEW PRICE	OLD PRICE
Roadster	\$3,950	\$3,700
Five-passenger touring	3,950	3,700
Seven-passenger touring	3,950	3,700
Sedan	5,650	5,400
Limousine	5,500	5,250
Landulet	5,550	5,300
MODEL 3-35	NEW PRICE	OLD PRICE
Seven-passenger touring	\$4,300	\$4,100
Sedan	6,000	5,800
Limousine	5,850	5,650
Landulet	5,900	5,700

PHILADELPHIA SHOW PAYS TAX

Philadelphia, Pa., Jan. 25—The Philadelphia show is one of the best ever held. It is good from a decorative standpoint, and the exhibits are laid out well with a resultant show that is open and airy. Dealers at the show report sales fairly good though cars are hard to get. The usual old-time spring rush is expected, though possibly not on so large a scale as before. The exhibition is absorbing the war tax.

That is, on a 50-cent admission the show is paying a tax of 5 cents, and the admission nets the show 45 cents instead of half a dollar. On passes the show paid a tax of 5 cents a day and in a lump sum. Government inspectors were at the door and kept very close watch on the situation. The show was held in the Wanamaker garage, which is the best exhibition place Philadelphia has had. The dealers' association was somewhat embarrassed for a building before this was offered.

WICHITA TRUCK COSTS MORE

Wichita Falls, Tex., Jan. 25—Effective Feb. 1st the prices of Wichita truck chassis will be increased as follows:

MODEL	CAPACITY	OLD PRICE	NEW PRICE
A	1 -ton	\$1,750	\$2,800
K	1 -ton	1,750	1,800
L	1½-ton	1,950	2,100
B	2 -ton	2,250	2,500
M	2 -ton	2,250	2,500
R	2½-ton	2,500	2,700
O	3½-ton	3,450	3,600
Q	5 -ton	4,000	4,300

WIRE WHEEL BRINGS SUIT

New York, Jan. 26—The Wire Wheel Corp. of America has started suit charging infringements of five of its wire wheel patents, Nos. 1,047,742, Pugh; 760,684, Cowles; 1,030,428, Cowles; 1,076,558, Duffy, and 1,125,498, Duffy. The suit has been entered against C. T. Silver, Metropolitan distributor of Kissel and Apperson cars, on the grounds that cars exhibited by Silver are equipped with Frayer-type wheels made by the Phelps Mfg. Co., Columbus, Ohio.

ITS NAME IS "MOTO-PEP"

The Moto-Pep Mfg. Co., Youngstown, Ohio, has been greatly annoyed by other concerns who use the name "Motor-Pep," which, while similar to the name of its product, is not the same. The Moto-Pep company gets its name from its product, "Moto-Pep." A recent item on this in MOTOR AGE referred to it through a typographical error as Motor-Pep.

CHURCHWARD OUT OF A. B. C.

Detroit, Jan. 25—Alexander Churchward has relinquished his interest in the A. B. C. Starter Co. and is no longer connected with that concern.



One of the intercity trucks that will help make transportation simpler



This is part of an American air squadron in training in Great Britain. A British flight sergeant is shown on the left giving a lecture to the American aviators. Most of them are young college men. They are wearing the cap that is the distinctive feature of the uniform of the British Royal Flying Corps

Our Boys in Europe Get Ready

It was a gala day for U. S. marines when this photograph was taken. The village is bedecked with decorations and banners of welcome. The inhabitants are, if anything, more eager to see our boys than our boys are to see those of France

Some of the boys are coming to town on truck-loads of provisions, as at the right, while others are marching chipperly along beside them. This is an Ohio regiment soon after its arrival in France for training before going into the trenches



At the right is a view of a French aviation camp, showing the machines and hangars. It was photographed from another airplane, flying over the camp, the different parts of which can be seen in the foreground. This gives a close view of air camping



The airplane view at the bottom of the page is of Vandesson, a village on the Aisne front. The French drove the Germans out of this section, conquering many strong positions and capturing 7,500 Germans—a 3-mile gain along a 7-mile front in all

Battery of motor plows in action near the front. The field is being plowed under the direction of a French agricultural officer, who is shown on horseback. This is one of the British official photographs



New Offerings at Chicago Show

Bodies and Cars Which Were Absent from New York Now Are Being Exhibited at the Coliseum

THERE are always cars displayed at the Chicago show which were not exhibited at New York. In some cases, cars were not completed soon enough, or the makers, being located centrally, took space only at Chicago, thus avoiding transportation delays. The really new models at this year's Chicago show are few and in several instances the change consists of new body types only. So far as innovations are concerned, there has been a slowing up. Novelty of design which have characterized many of the former shows are fewer. War work and the resultant drain of manpower skilled in car design and construction, inability to get materials and conditions generally have prevented this.

Several makers have cars which, although shown at New York, are entirely new models, viewed for the first time by the mid-western motoring public. Such cars as the little Overland, new series Studebaker, Reo little four, Hupmobile and Olympian are examples of this. In several instances chassis have not been altered materially, the main changes being in the bodies, in which straight horizontal lines

By B. M. Ikert

Motor Age Editorial Staff

have been substituted for the curves of previous years. For example, the Cole has a completely redesigned line of bodies known as the Aero. Scripps-Booth bodies have been tailored so they form no semblance of the previous models.

Show patrons who visit the Salon will see for the first time the Deering-Magnetic, an absolutely new product. In the Armory is the Hackett, three models of which are shown. The salient feature of this car is the novel rotary-valve engine with which it is to be fitted later in the year. In the Dodge Brothers exhibit is a fashionable looking town car, the body of which is a product of the Dashiell Motor Co., Chicago, distributor of this car. Similarly, there is a limousine body mounted on a Marmon chassis in the Marmon booth exhibited by the Chicago distributor. The Elgin Motor Car Corp., Chicago, is showing its new sedan. Briscoe also has a new all-season car. The Maibohm Motor Co., Racine, Wis., has a handsome new touring car at the show

in connection with its two-passenger roadster of the previous season.

Deering-Magnetic at Salon

Visitors at the Salon inspected the Deering-Magnetic for the first time. Naturally, the chief point of interest on this car is the transmission of power. This car uses a six-cylinder Dorris engine, of the overhead valve type. The bore and stroke are 3 by 5 in., the actual horsepower being 70, it is stated, while the S. A. E. rating is 38 hp. The crankshaft and camshaft operate on seven bearings. Lubrication is by pressure feed, oil being pumped from a reservoir to the main connecting rod and wristpan bearings. Carburetion has been assisted by a hot-spot in the manifold.

Two of the four models are shown, the road car, seven-passenger, and the all-season sedan. The bodies of both road car and sedan are on a 132-in. wheelbase chassis and fashioned after the bevel-edge design. Graceful lines and a massive radiator typify plenty of power under the hood. An impression of speed is given by the low construction also. The road car has a military tone, being finished in Mist O' Marne blue, with wire wheels, fenders, gas tank and running gear painted red for contrast. Upholstery is in black leather.

Jordan New Show Model

A new show model is the Jordan Suburban which is really a larger edition of the Jordan Sport Marine, but with seven-passenger capacity. It is mounted on the standard 127-in. wheelbase, but the body design is so worked out that a heavily-raked steering column is used. The chassis is 2 in. lower than the standard Jordan chassis, accomplished by improved spring suspension, and the body is 3 to 4 in. lower. It is sold in two color options, namely, Liberty blue, with black running gear, and Brewster green, with black running gear. As a complete seven-passenger job, it sells at \$2,375, including complete equipment consisting of 33 by 4½ Firestone cord tires, wood wheels, Burbank top, clock, tonneau light, traffic bumper, Macbeth lens and extra tire and rim. Production will begin Feb. 1.

Maibohm in Debut

One of the entirely new models shown for the first time at the Chicago show is the six-cylinder sport phaeton Maibohm, a product of the Maibohm Motors Co., Racine, Wis., which concern hitherto has specialized in a four-cylinder sport roadster, one of which model is also on exhibition. The new six is finished in powder blue, with khaki top, while the roadster is in gray, with khaki top and blue wire wheels.

The Maibohm six has a Falls valve-in-head engine, 3½ in. by 4¼ in., with detachable head and valve adjustment is outside the cylinder head. The intake manifold cast integrally with the cylinder head gives



Town car body exhibited on Dodge Brothers chassis by Dashiell Motor Co. of Chicago



Reo little four, which is displayed for the first time at Chicago

a clean carbureter installation and a short hot-air tube to the integrally-cast exhaust manifold connection.

The distributor is an independent unit on the rear deck of the crankcase, permitting a simple wire layout. The generator mounting is easy to get at and the instrument can be removed by loosening two screws. Engine equipment consists of a Wagner two-unit, 6-volt starting and lighting system, Atwater Kent ignition, Willard battery, Stromberg carbureter, Perfex radiator for thermo-syphon cooling, Borg & Beck clutch and Mechanics three-speed gearset in unit with the engine. The gearset has a worm-and-pinion speedometer drive inclosed in the case.

A feature is the placing of the battery and the adjusting turnbuckles on both brake rods directly under the front floor boards, giving free and easy access to them. The battery is removable from its steel cradle and the large turnbuckles make brake adjustment an easy matter.

Hotchkiss drive is used, through two universals and a tubular propeller shaft to the floating axle. Brake drums are 12 in. in diameter with 2½-in. face. The muffler is a Maxim silencer and the steering gear a Jacox.

Springs are semi-elliptic; tires are 32 by 3½ in.; wheelbase, 115 in., and road clearance, 10½ in.

The six-passenger job is long, low, narrow and rakish in appearance. The body does not project into or over the rear fenders, which extend 10 in. on each side. The rear seat accommodates two grown persons in comfort and two auxiliary folding seats in the tonneau give a total comfortable seating capacity for six persons.

The khaki top has the victoria shape and gives the appearance of such a top when viewed from the back. Gypsy curtains completely cover the top bow sockets and have a round beveled-edge plate glass curtain window in each side. There is an oval glass in the rear. Price of both the four-passenger and six-passenger touring styles is \$975. Finish is optional.

Auburn Sport Roadster

One of the new cars at the show is the Auburn sport model at \$1395, equipped with six-cylinder engine and mounted on a 120-in. wheelbase. It is an unusually roomy four-passenger job with the front seats divided by a wide aisle. The leather upholstery is done in the flat French pleat style. The straight-line body design carries the windshield placed at a pronounced tilt. The chassis follows the general Auburn construction with such features and has 32 by 4-in. tires. The Auburn six engine develops 43 hp. at 2150 r.p.m.

The Auburn sport model is offered in three striking color options of ash gray, body, fenders and wheels; Auburn maroon body and wheels with black fenders; royal blue body and wheels also with black fenders.

The attention to details is evidenced on all sides. For example: There is a locker under the rear deck to which access is gained by removing part of the rear seat upholstery, which comes out in a rectangular block form. Thus it is possible to carry packages conveniently in this compartment. To meet the demand of those who want extra large power and high speed,

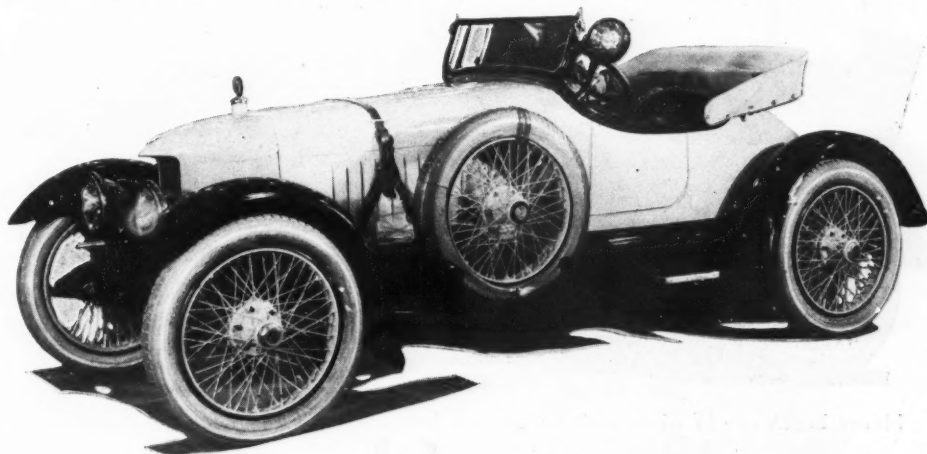
the Auburn Sport model is also built on a large chassis, with 131-in. wheelbase and 55 hp. engine at \$1685.

Hackett

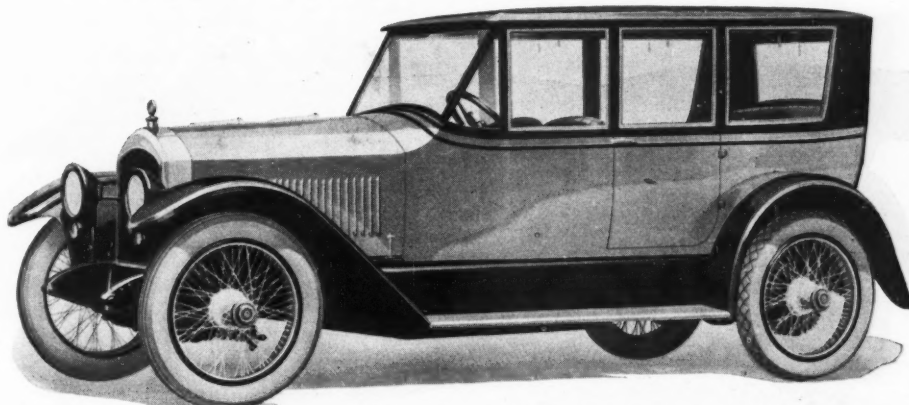
The Hackett Motor Car Co., Jackson, Mich., exhibits three models all using the same chassis. One is a two-passenger roadster in olive green, one a five-passenger touring in brown, and the third a collapsible sedan in maroon. Hackett also exhibits one of the new Guy rotary-valve engines with which the Hackett line is to be equipped later. The valves are disk-shaped with only one surface in contact with the seat, requiring that only one surface be kept tight, hence the valve is free to expand and compress without binding, it is claimed. The valve-driving mechanism is by spur gears attached directly to the stems of the valves and driven by a smaller gear, the latter driving the two middle gears attached to the two middle valves and these in turn operating the outer

cylinder valves by being in mesh with them. The valve disks are cut with eight ports which means there are four intakes and four exhausts per cylinder. There are only three working parts to each cylinder. The gears operate in a bath of oil and are noiseless. The valve-driving mechanism operates ⅓-crankshaft speed and due to the rotating motion of the valves, the latter are said to be self-grinding, thus making them carbon proof. The top of this engine has an aluminum head plate.

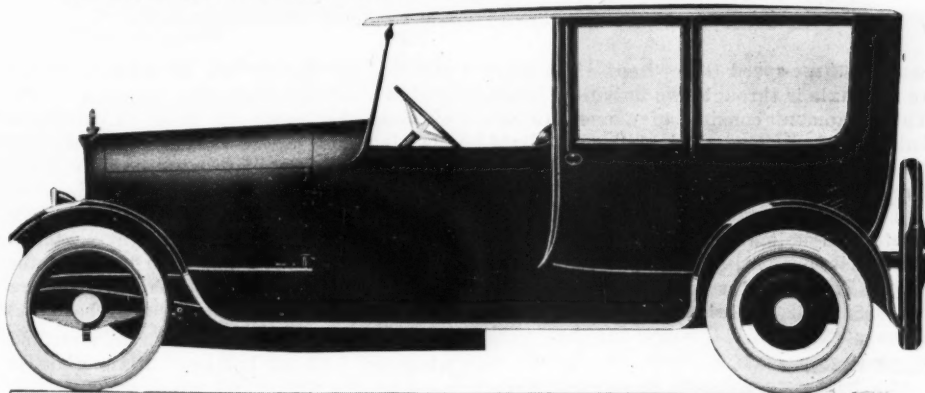
The chassis has a 112-in. wheelbase fitted with a unit powerplant. The engine used in the present model is a four-cylinder, 3¼ by 4½. Hotchkiss drive is used. The gears in the rear axle are of the plain bevel type. Wood wheels are standard equipment, carrying 32 by 3½-in. tires. Connecticut ignition is used while starting and lighting equipment consists of the Dyneto two-unit system. The radiator is cellular and cooling is by thermo-syphon. The gear-



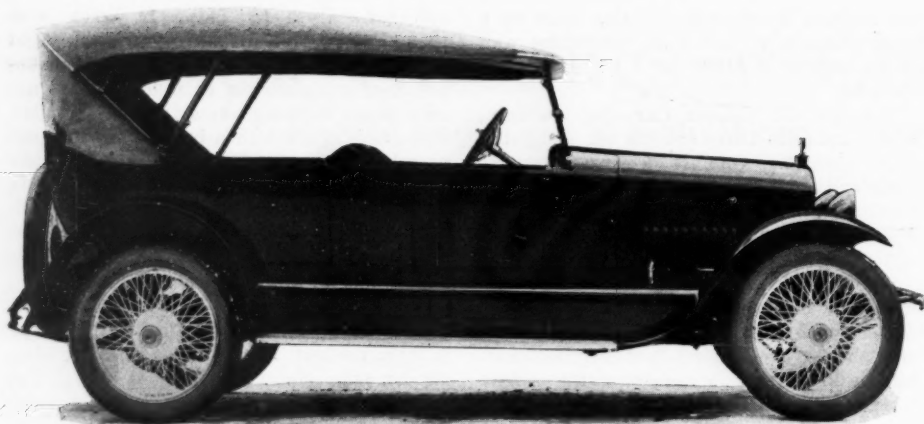
Chalmers speedster, which is duplicate of one used by Dawson in records



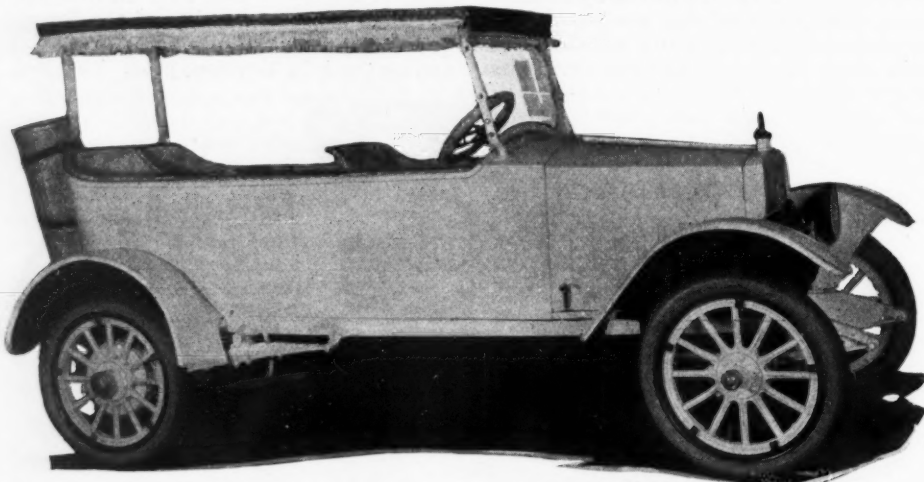
Deering-Magnetic sedan, which is being exhibited at Congress hotel salon



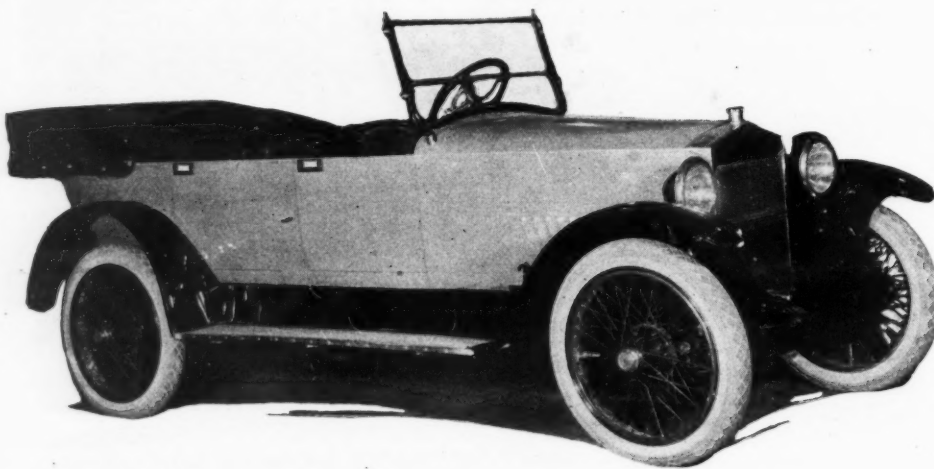
Limousine body on Marmon chassis exhibited by Marmon Chicago Co.



Jordan tourist has advanced lines with high rounded hood



Moore beach car in white with basket trim; the front seat passenger is replaced by a hamper



Hollier touring car with an European cast of countenance

set is a three-speed Grant-Lees. The drive to rear axle is through two universal joints. The equipment consists of a one-man mo-hair top sloping windshield, trouble light, tools, pump and jack. There is a neat walnut instrument board, carrying lighting and ignition switches, ammeter, speedometer, oil indicator, carbureter, adjusting dial, instrument light and trouble light plug. The roadster and touring car sell for \$985 and the all-season car or open sedan at \$1,165.

Elgin Sedan

The Elgin six sedan is Springfield type, with two doors, one on each side, con-

structed so that it can be entirely closed for winter or open for summer. The chassis, the same as used on previous models, incorporate a unit powerplant, Borg & Beck dry-plate clutch and Wagner lighting and starting system. The interior is upholstered in Bedford cord up to the belt line with a lighter weight material above. Ample room has been provided for seating five persons. The front seats are the bucket type with passageway between. The cushions are covered with gray striped whipcord without buttons. Plate glass is used in the doors and windows with silk curetains for rear and rear quarter win-

dows. The steering wheel can be adjusted so as to bring it out of regular driving position, providing plenty of room for the driver in getting to and from his seat. The floor is covered with Brussels carpet and held in place by snap fasteners. An electric dome lamp is located centrally for lighting the interior. The finish is in black with silver striping on the body and wheels. The price is \$1,645.

New Reo Four

The new Reo shown for the first time at the Chicago show is the light four Reo offered in both five-passenger touring and three-passenger roadster models. The bodies follow the latest tendency in design and have the top sides tumbling home. Both cars use the same 120-in. chassis with semi-elliptic springs. The rear is especially strong, being 54 in. with ten leaves. The engine, $4\frac{1}{8}$ by $4\frac{1}{2}$, has cylinders cast in pairs with integral heads. The main bearings are babbitt and are adjustable from the outside. The camshaft is driven by helical gears. The engine is four-point suspended on a sub-frame. The Johnson carbureter has a steering column air control. Ignition is from a Remy generator which furnishes current for lighting and starting. The latter system is of a 6-volt type, using a Willard 100-amp. hr. battery. Cooling is by gear-driven centrifugal pump.

From the engine the drive is through a dry-plate clutch and three-speed gearset. The drive is Hotchkiss. The gear reduction from engine to rear wheels on high is 4.3 to 1. The semi-floating rear axle uses spiral gears. The steering gear is on the left side with adjustable bevel gear and internal sector-and-pinion type reduction. The diameter of the steering wheel is 18 in. The standard color is marine blue body, cream wheels and black fenders and running gear. The five-passenger touring has a one-man top with curtains and slip cover. The upholstery is of leather over Marshall cushion springs. Removable lights in the rear of the top provide for ventilation and easy renewal of celluloid. The roadster body has three-passenger capacity on one seat. It is furnished with foot-rail and detachable curtain supports on both doors and has extra large luggage space with a door at the rear. The windshield is slanting and fitted with rubber window strips at center and bottom. The tank capacities are: gasoline, 18; water, $3\frac{1}{4}$ gal.; oil, 3 qt. Regular equipment is furnished, consisting of speedometer, ammeter, tools, etc. The price of the touring or roadster model is \$1,225.

Pan-American

The Pan-American Motors Corp., Decatur, Ill., shows a five-passenger touring car, a four-passenger close-coupled and a four-passenger sedan. All use the same six-cylinder chassis with Pan-American Rutenber engine, $3\frac{1}{8}$ by 5. The standard wheel-base is 120 in. Wood wheels are regularly fitted. Gasoline is fed to a Rayfield carbureter by a Stewart vacuum tank, drawing from a 20-gal. tank. The main tank has a large filler cap with gage and drain plug at the bottom.

The frame has a double kickup at the rear and reinforced by four independent cross members which with the rear engine support are said to eliminate all frame torque, body squeaks and climbing hood.

The rear semi-elliptics are 58 in. long, underslung and suspended directly under the frame. There are wick-oiling devices for all spring shackle bolts and for the steering knuckle pins. The chassis use a Borg & Beck clutch and Warner gearset in unit with the engine. The tubular propeller shaft carries two universal joints. Both axles are Timkens. The brake drums are 14 in. in diameter. The steering gear is a Warner. An 18-in. corrugated walnut wheel, with horn button and control levers on top is used. Tires are 33 by 4½ in. The electrical equipment consists of a 6-volt Gray & Davis system for starting, lighting and ignition, with a Willard battery. The headlamps carry dimmer bulbs. The mahogany cowl board contains lighting and ignition switches, fuse box, oil gage, ammeter and speedometer dials, carburetor control and dash lamp. The headlamps are fastened directly to the fenders with a liberal tie rod with license clamps. The fenders are full crown type bolted together as a unit. The purchaser is given a choice of four colors: Pan-American maroon, gun metal gray, Pan-American blue, and a new military brown. The price is \$1,500.

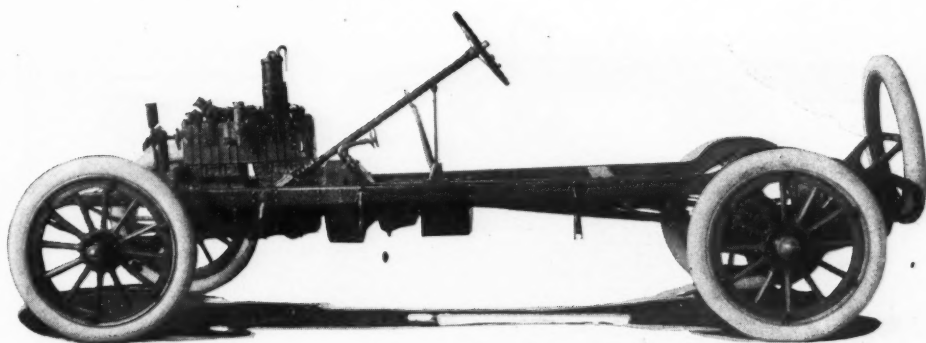
Dodge Special Town Car

A special town car body on a Dodge chassis is the product of the Dashiell Motor Co., Chicago. This body is designed to meet the demand for a neat, medium-priced vehicle. It is in red up to the belt line with the remaining parts black, and has the interior upholstered in a very thorough manner, in which the workmanship ranks favorably with the high-priced cars. Appointments are complete to the last detail and consist of the neatly-arranged compartments fitted with toilet articles, etc. The upholstery is of plain material without buttons, and the interior of the ceiling and sides is trimmed to match. Noteworthy features are the roominess and light provided by large beveled-edged plate glass windows. The car as it stood on the floor was priced at \$2,300.

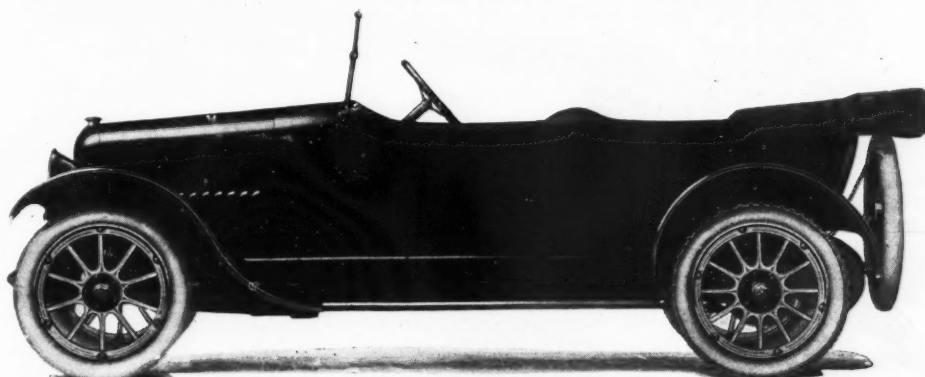
Chalmers Speedster

A car which attracts unusual attention is the Chalmers raceabout, which is a duplicate of the one with which Joe Dawson established a 24-hr. record at Sheephead Bay, N. Y. last fall. Essentially, the chassis is a Chalmers with the exception that the engine is placed a little farther back. The aluminum body is fashioned to reduce wind resistance as much as possible. The show car is in yellow with black running gears and wire wheels. An option is given as to the color inasmuch as only twenty-five of these cars are to be made. One of the novel features is the gasoline feed to the carburetor, in that the main tank is located under the rear deck and smaller tank feeds by gravity to the carburetor. To get the fuel from the large tank to the smaller you use a nickel-plated hand pump placed on the instrument board in front of the passenger seat.

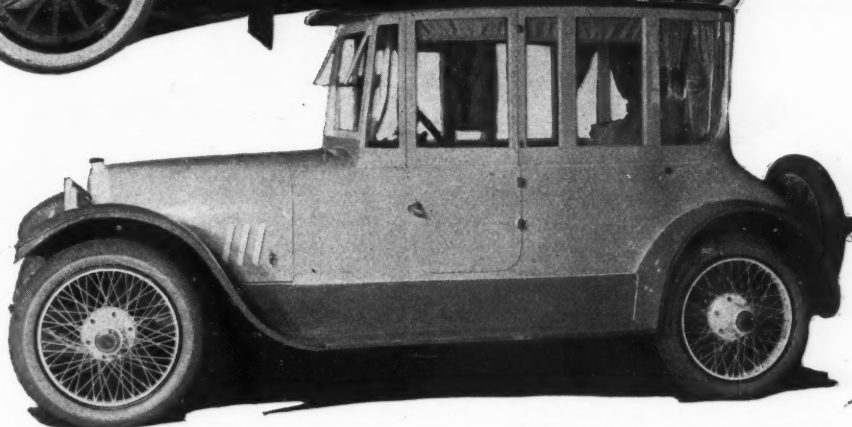
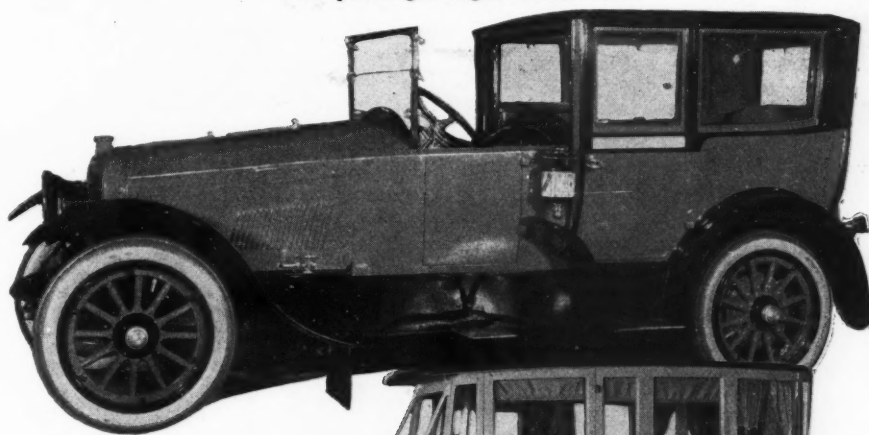
With a standard gear ratio of 3 to 1, it is claimed a speed of 80 m.p.h. is made. There is a metal shield over the radiator tapered in such a way to reduce the amount of air striking the cooling surface. Equipment includes six wire wheels, the extra two being mounted one on each side of the car. There are no running boards, the fenders simply following around the wheels



Chassis of Maibohm



Five-passenger Elgin of new lines



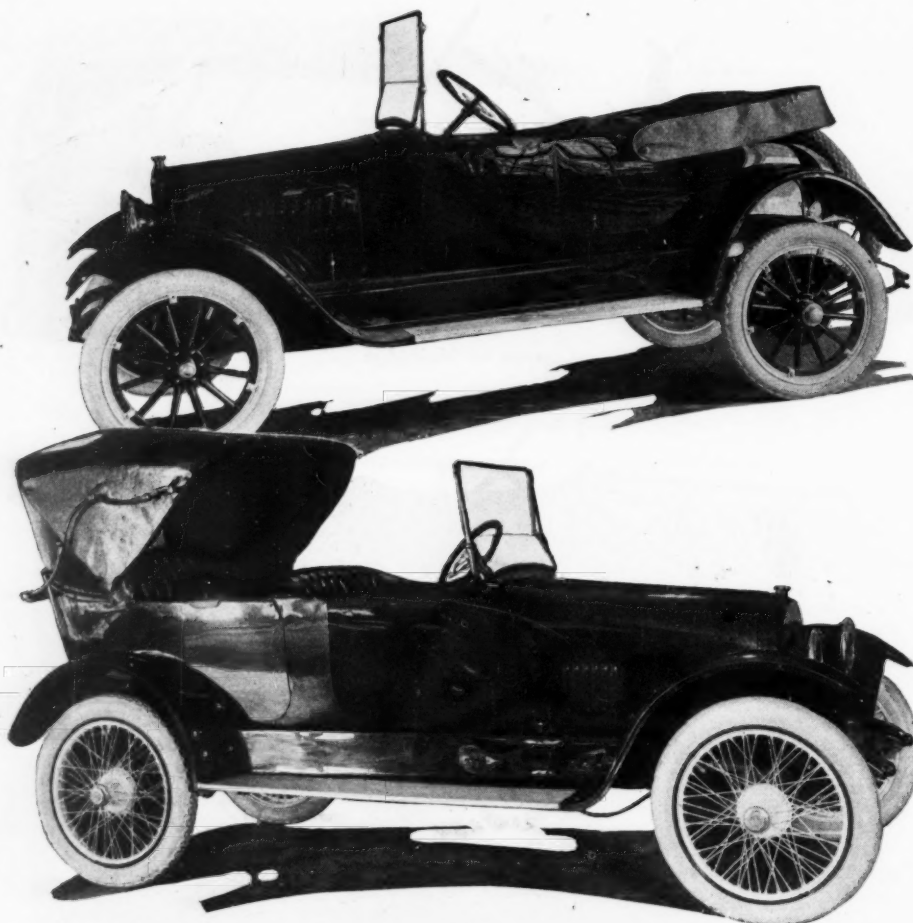
Two new inclosed bodies. Above, Dorris town car; below, Pan-American sedan

and ending just below the frame edge. A glass-protected card is attached to the instrument board carrying the signature of Dawson. This card sets forth the fact that the car is an exact duplicate of the one which performed at New York as stated above. There is also an unusual khaki top which when up blends well into the general lines of this speedster design.

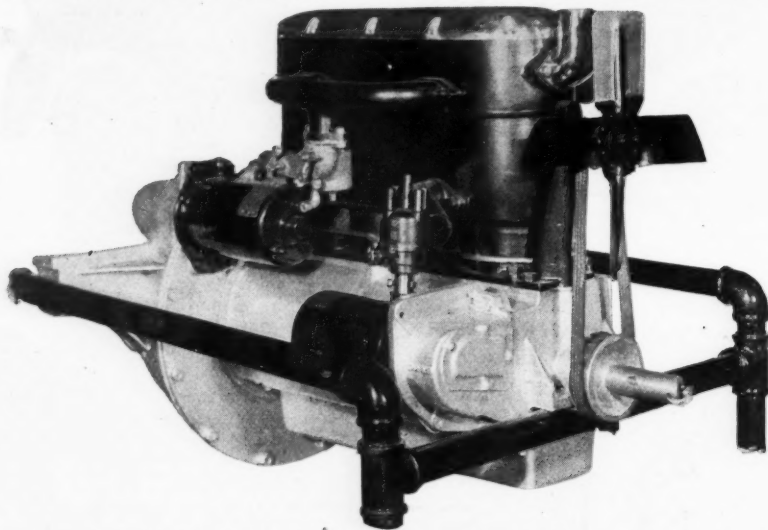
Briscoe in New Open Sedan

A two-in-one model that can be used as an open touring sedan for summer driving or as a limousine, if the weather threat-

ens, is the new five-passenger sedan shown at the Chicago show by the Briscoe Motor Corp., Jackson Mich. It is mounted on the 4-24 chassis and mechanically the car is the same as the touring model. The tonneau is quite roomy and doors are of the staggered type. One of the incidental features of this model is the large compartment for necessities between the back upholstery and the back window. This is large enough to store several suitcases. The general lines of this body are molded to conform to the rest of the car design



Above, Dixie Flyer, a four-passenger model and, below, Maibohm with Victoria top



Carburetor side of new Hackett rotary-valve engine

and the sharp curves offer just the right amount of relief to what would otherwise be a severe design. The rear window is set back quite a distance from the upholstery which allows the occupants plenty of room, especially when hats are worn.

Comet

The Comet made by the Comet Automobile Co., Decatur, Ill., is a six-cylinder design with the cylinders cast in block. Bore and stroke are $3\frac{1}{2}$ by 5 in. Lubrication, a combination force feed and splash, has individual, constant-level troughs for cranks. Intake ports cast in the exhaust manifold provide for preheating the gas mixture. Cooling is by a centrifugal water

pump. A roller bearing fan with five double blades is used.

Starting and lighting are by the Dyneto two-unit system with Bendix drive to the flywheel. Ignition is Delco. A multiple-disk, dry-plate clutch is used, and the three-speed gearset is in unit with the engine. Two universals take the drive through a tubular propeller shaft to the three-quarter floating rear axle. Cantilever self-oiling rear springs, $2\frac{1}{2}$ by 50 in. are used. Tires are 33 by 4. The wheelbase is 125 in., and a road clearance of $10\frac{1}{2}$ in. is given. A 22-gal. gasoline tank is mounted in the rear with a sight gage.

Standard equipment includes dimmers,

windshield searchlight and trouble lamp and locking switch. The body is a streamline, double-cowl type with high body sides and upholstery in long-grain, bright finish Galloway. The windshield is a slanting, rain-vision and ventilating type. Standard color is blue with black radiator, fenders, hood and skirts. The price is \$1,285.

VALUE OF STANDARDIZATION

New York, Jan. 26—No better example of the value of standardization can be found than in the message given by Henry R. Sutphen, of the Elco Works, Bayonne, N. J., to members of the Society of Automotive Engineers at the Automobile Club of America last night.

It was standardization which made possible the production of 550 80-ft. submarine chasers in the remarkable time of 488 days. And it is standardization which is going to make possible the production by the same company of 150, 5000-ton steel cargo vessels at the rate of two finished ships a day. More than 200 members and guests heard Mr. Sutphen's talk and others by Irwin Chase, designer of these 80-ft. chasers, W. S. Howard and Capt. A. P. Lundin.

Mr. Sutphen told substantially the same story of the conception, design and construction of this fleet of submarine chasers, which is now doing duty abroad, as he told before the meeting of the Society of Automotive Engineers in Washington last spring; he told how these boats were fabricated 1000 miles from their place of assembly; how only 5 per cent of the men who did the assembly work could understand English, being French-Canadians; how only 2 per cent of these men had ever been engaged previously in boat building; and how there was never a hitch in the assembly of the chasers, which were finished long before the specified contract time and which have since shown themselves well worth the American-inventive genius, thoroughness and perseverance which made them possible.

The manufacture of the 150, 5000-ton steel cargo vessels will be carried on in much the same way as the 80-ft. wooden chasers were produced. Experience with these boats made plain the limitations of standardization when wood is used, because wood will not stay put as will steel.

For the first time in the history of ship building, structural steel shapes such as are used in the building of bridges and skyscrapers are to be used in the production of ships; such shapes are to take the place of the usual steel ship plates. The design of these cargo vessels, and their method of construction, has been passed by the highest shipping and insurance authorities as equal in strength and seaworthiness to the best ships built by ordinary methods.

Already the keels of four of these ships have been laid and the production of the fleet will be carried on in much the same way as Henry Ford produces motor cars. The various parts are to be fabricated in forty-eight shops scattered all over the United States. The parts will be shipped to central assembly places and the ships erected by unskilled labor recruited from building, bridge building and other trades familiar with structural steel work but not

necessarily at all familiar with shipbuilding. The shops that are producing the parts, in nearly every case, have never seen a completed ship of the kind that is to be built—and may never see a ship. More than 90 per cent of the material will be built in these structural steel shops.

Schools will be established for the instruction of workmen in assembling the ships and each man will be taught a particular detail, as is the case in Ford's plants. It is the plan to employ any man who can stand on two feet, has two arms and is healthy.

The whole scheme requires the use of entirely new materials and methods. Even the machinery has been thoroughly standardized. Turbine engines are to be used—a total of 225,000 hp. being required for the fleet—because turbines can be manufactured whereas reciprocating engines require to be built. It will be possible to turn out the machinery more rapidly than the hulls can be completed.

The keynote of the success of the task depends upon the accuracy of the drawings, with parts being made in forty-eight different shops. This accuracy already has been demonstrated. When the first keel was laid, a structural steel shape was fitted to it, and another produced in a shop more than 1000 miles distant, when laid alongside the first fitted to a hair's breadth.

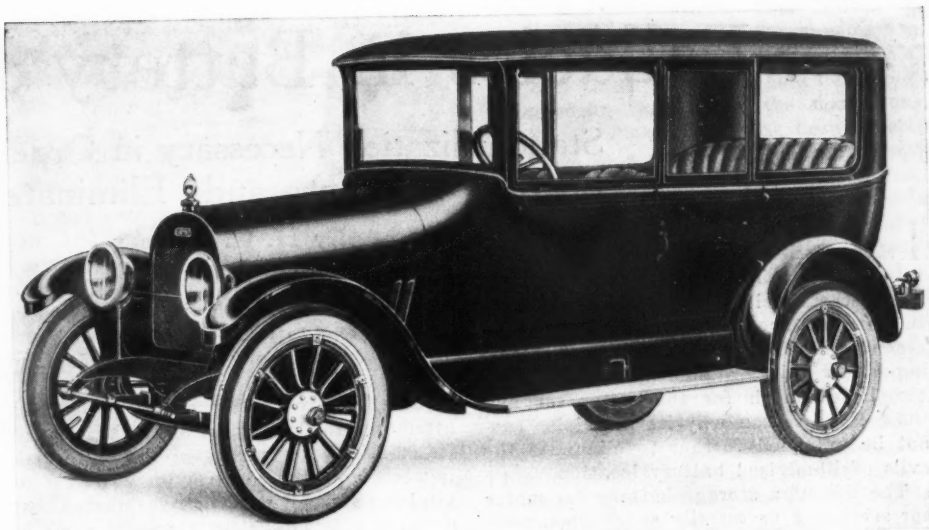
TRACTORS FOR ALL OHIO

Columbus, Ohio, Jan. 26—Methods that might be employed in getting farm tractors into every community in Ohio this spring were discussed by Governor Cox and members of the state board of agriculture in a conference recently. The question then was taken further at the annual meeting of the state board afterward. The general plan and the hope of state officials is to get tractors into each community so that they may be operated much as threshing machines visiting from farm to farm. General use of tractors in this way, it is declared, will mean cultivation of thousands of acres of land that farmers otherwise will have neither time nor means to cultivate.

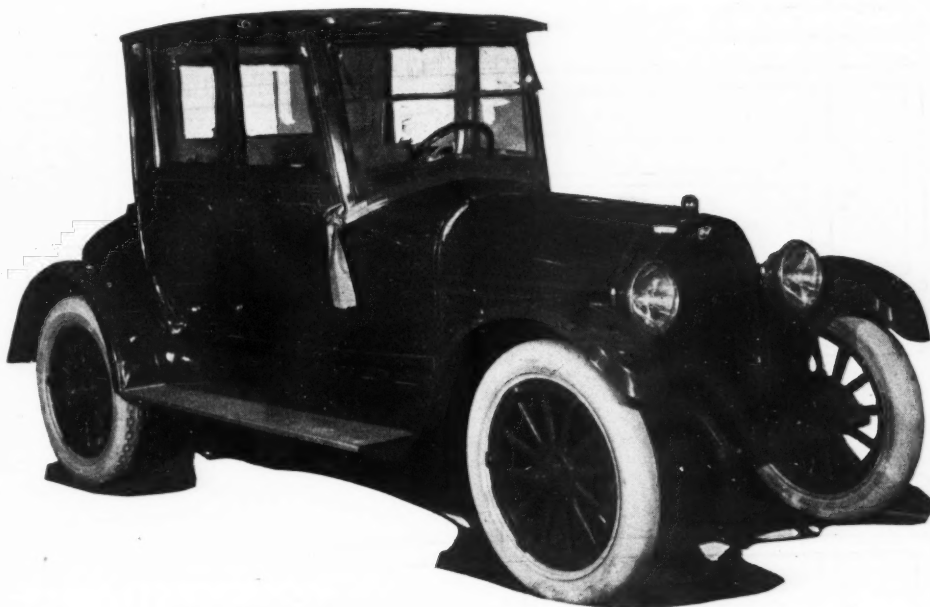
TWO NAVAL OIL RESERVES

Washington, Jan. 26—In the annual report of the director of geological survey, Department of Interior, just made public, attention is called to the creation of two Naval oil reserves in Colorado and Utah. The survey has been investigating the oil reserves in the United States that give the most promise of yielding a commercial supply of oil and has explored large areas in Colorado and Utah that contain immense deposits of such shales, some of which carry 30 to 50 gal. of oil to the ton. This potential resource is estimated by the survey in terms of billions of barrels of oil, which it is believed can be extracted economically from the shales, possibly in competition with petroleum at present prices. It is therefore of special interest to note that during the last year two oil-shale reserves were created for the use of the Navy, one of 45,440 acres in Colorado and one of 86,584 acres in Utah.

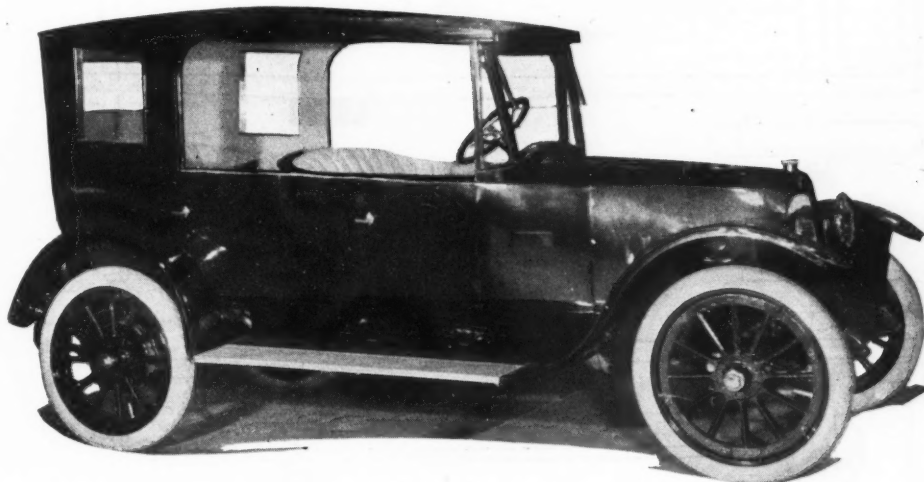
General classification of oil-shale land was continued by the survey during the



Comet sedan on six-cylinder chassis



Reo coupe model with Greek key design on body



Hackett sedan, one of the new show models

year, the work covering large areas. Geological examination of the oil shale region of the West has shown that the oil shales in Utah and Colorado contain enormous quantities of petroleum. They also contain

a considerable percentage of nitrogen, aggregating a vast supply, which can be recovered as a by-product in the refining of the shale and used either as a fertilizer or in the manufacture of explosives.

Fallacies in Battery Locations

Standardization Necessary in Order to Make Service Efficient and Eliminate Neglect

By H. C. Skinner

Motor Age Editorial Staff

IN spite of the paramount importance in the modern motor car of the storage battery many engineers seem to disdain giving it the consideration that it deserves. In many instances it seems as if a deliberate attempt had been made to hide this important unit. Standardization has accomplished much for the motor car and there is no reason why its principles cannot be extended further to eliminate the evils of ill-advised battery location.

The life of a storage battery for motor car service is necessarily short when compared to its life in other fields of useful-

ness, due chiefly to the rigor and variety of conditions to which it is subjected. Its worst enemies are neglect, overheating and undercharging. In many instances of trouble, the two latter conditions can be attributed to the neglect of the battery, as its efficiency depends upon the plate area immersed in the electrolyte. This is of vital import as it must be remembered that a battery is no better than its weakest cell.

However, its life can be increased considerably provided proper location is made to facilitate maintenance by the owner, as a study of average practice shows that the location varies from one that is accessible to being isolated under the body or floor boards. It is known among battery manufacturers that the average life of a battery is decreasing, which can be attributed partially to the battery location. The psychological effect of this is that the owner likely will neglect a thing that is inaccessible. The inaccessible battery usually receives but a small part of the attention that it requires.

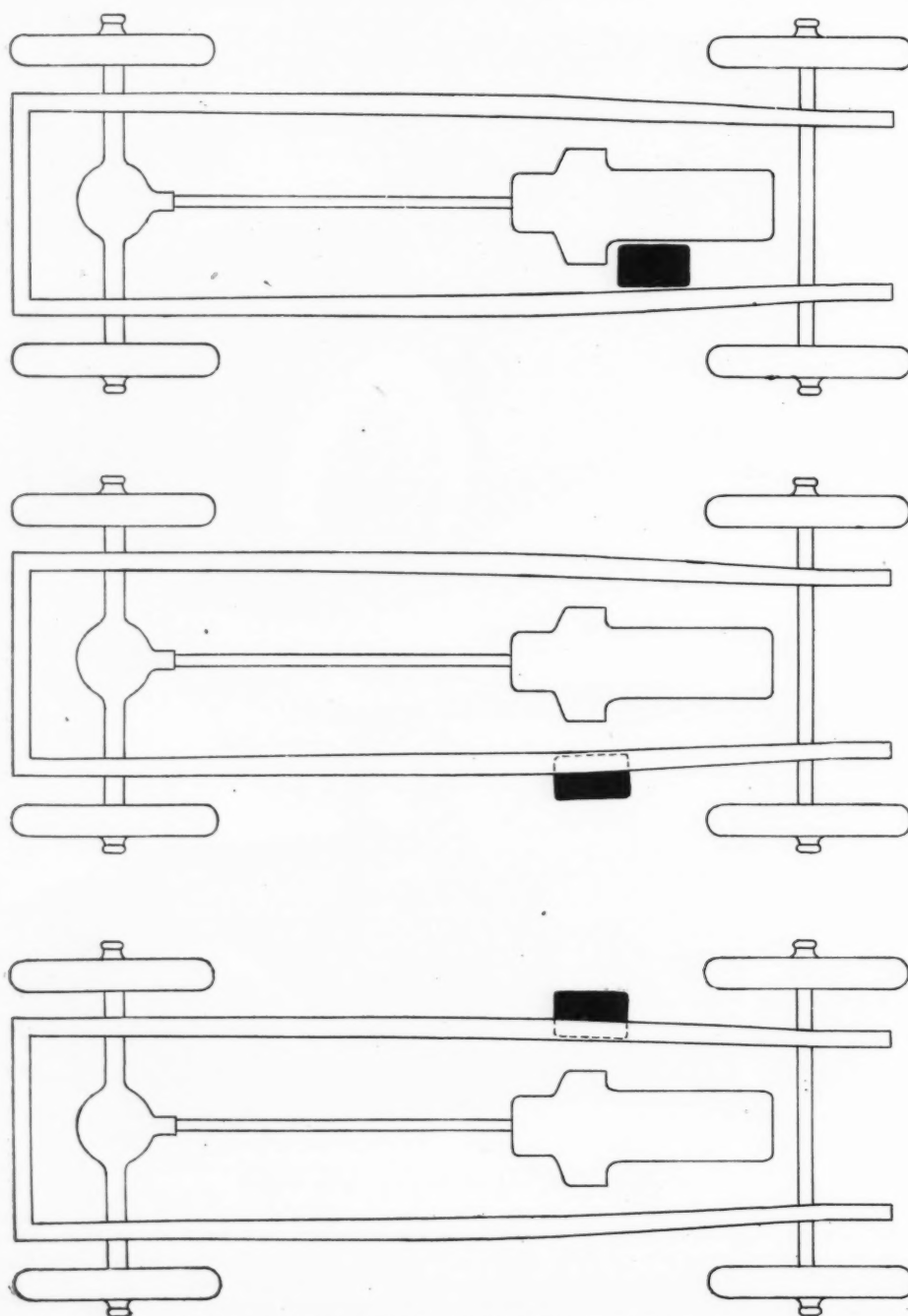
To prove the variation in battery locations, it is only necessary for an owner to drive into a service station and ask to have his battery watered. If the service man is wideawake his question will be, "Where is the battery located?" However, if he is not as wideawake as his fellow employee he will commence looking for the battery and make a fool out of himself in the opinion of the owner regarding his ability. Of course, the service man is not to blame, because he cannot be expected to know the location of the battery in every make of chassis, as even some companies have different locations for different types of bodies.

Under Floor Boards

Batteries that are located under the floor boards or in the body always cause considerable confusion in servicing as it makes it necessary for the car occupants to leave the car, to have the battery watered. Also it invariably requires the services of two men to handle a battery which is isolated, while an exterior location saves time and can be handled by one service man.

An analysis of the cars exhibited at the Chicago show indicates that in the majority of cases the battery is located underneath the forward seat. Next comes the class in which the battery is located under the front floor boards and it is noted that in only a few instances are provisions made for the speedy removal of the floor boards. There are three locations noted in which it is not necessary to disturb the occupants of the car to water the battery. These are underneath the running board to frame splasher, alongside of the engine block under the bonnet and on the running board proper.

The location of the battery under the forward seat is simply a makeshift and is probably the favorite place, because it does not materially increase the cost of production. It is also the most accessible of the interior locations. However, it is bad practice, especially when we consider the increasing number of closed cars, as most owners realize sooner or later that cleanliness and service are two things not in harmony with each other. Of the other interior locations the one under the floor board follows the under seat location in



Three typical installations of battery boxes on motor cars

popularity. It is even more distressing than the forward seat location, as except in a very few instances no provision is made for the watering without removing the floor boards. In either of these cases when a car is driven into a service station, the car occupants must get out before the battery can be given attention.

The exterior locations comprise under the running board to frame splasher, under the engine bonnet and on the running board proper. Perhaps the lack of favor of the splasher installation is due to the expense incurred by this mounting as there are only a few examples of it and these on well engineered designs. The advantages of this installation are manifold. It is well protected, very accessible and easily removed if necessary.

Appearance is the chief objection to the running board location, otherwise it is the ideal, although it is not so well protected as the splasher installations and probably is less expensive.

It seems from this that if a standard location of the battery were adopted, all this confusion in servicing could be avoided. Obviously the preferable location would be under the running board to frame splasher or else on the running board proper. However, this latter installation is a trifle unsightly, but as motor car design at its best is simply a compromise, there are cases in which beauty must be sacrificed for economic maintenance.

Many Different Sizes

A representative of a large battery manufacturer recently made the statement that it is producing about 200 different sizes of storage batteries for motor vehicles. This is significant as it indicates that designers are not devoting as much study to this problem as they should, as the future trend in motor car design from the present indications seems to lie in the direction of economical maintenance. Also this fact prevents quantity production and therefore makes the battery rather expensive. Practically 90 per cent of the different makes of cars manufactured today use the 6-volt electrical system and those of higher voltage are comparatively rare. A few 12, 16, 18 and 24-volt systems are still in use, being limited to the cars that were constructed several years ago, and as these old cars are rapidly going out of service, the field will be left for the 6 and 12-volt types. Having these two voltages to contend with, it should be a comparatively simple matter to standardize on five or six types of different capacities for the modern cars of various carrying capacities and possibly ten or twelve types to take care of the older existing types.

The benefits to be derived from standardization of this character cannot be overestimated as the adoption of standard sizes and locations of storage batteries will facilitate both production and servicing. When one considers the enormous number of different types of batteries from the standpoint of the service station, it is remarkable that the service is as good as it is. The principle factor in this is the large parts stock that must be carried for these different types, and most service stations cannot afford to carry the stock necessary to give satisfactory service. The only

relief for the situation is standardization, which will simplify design, reduce production costs and increase the ease of servicing.

MASON MOTOR CO. NO MORE

Flint, Mich., Jan. 28—The Mason Motor Co. has ceased to exist. It is now the motor and axle department of the Chevrolet Motor Co. The stock of the Mason company has been held in the treasury of the Chevrolet company for two years. Starting Jan. 1, 1918, the title Mason Motor Co. officially ceased to exist, the company now being a direct component of the Chevrolet concern.

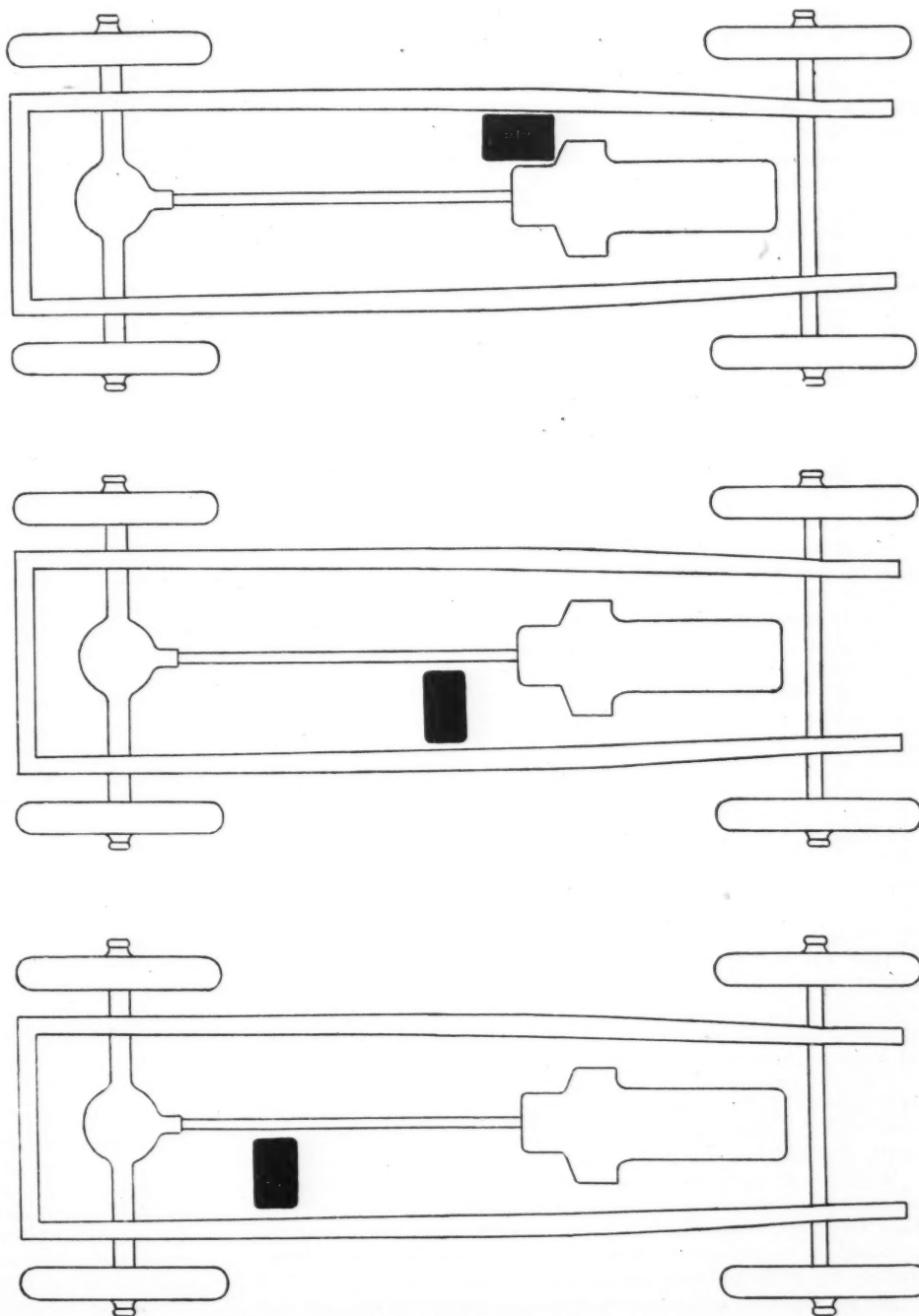
RACERS STORM PACIFIC COAST

Los Angeles, Cal., Jan. 25—After having announced patriotically that the Thanksgiving day race at Ascot Park would be the last until after the war, Barney Old-

field, Louis Chevrolet, Tom Milton and other drivers have been renewing their youth by barnstorming in Southern California. Races have been held here and at Bakersfield, Cal., under the management of W. H. Pickens. It has been reported that the gate receipts have been so satisfactory that plans are being laid for a match race with Oldfield, Chevrolet, Cooper and de Palma at Ascot Park March 10. There is no question that such a race, if it is run, would be a great attraction here. De Palma has never driven on the Ascot speedway. Chevrolet holds the 5-mile record with an average of 80.2 m.p.h.

AUTOCAR INCREASES PRICES

Ardmore, Pa., Jan. 26—The Autocar Co. has increased the price of the Autocar chassis from \$1,815 to \$2,050. Orders placed prior to Feb. 6 will be accepted at the old price.



Other ways in which the battery location may vary

Our Real Need Is Transportation

Motor Age presents herewith the message given by Hugh Chalmers to the motor car dealers of America in a convention of 400 at Cleveland. The need today is for transportation and not coal, he stated, urging the conscription of 100,000 trucks as a solution of the problem.—Editor.

By Hugh Chalmers

IF we are the third largest industry in the country—and we are, by statistics—for heaven's sake let us act like it and not act as if we were down somewhere about the forty-ninth or fiftieth.

In the first place, we, of course, are all Americans. We must be. We are all assembled under this one slogan, "Win the war." While we as business men would like to have business as usual, we are more interested in having democracy as usual after the war than we are in having business as usual during the war.

We cannot have business as usual during the war. We cannot have everything as we had it. There must be unusual conditions just like this order to close down for five days. We cannot have business as usual, but we do want business and industry as nearly as usual as we can have it and let the Government have its war program 100 per cent.

The war program of this country must come first, and after that we must have industry.

After three months of careful and intensive study I do not believe this country can carry on a protracted war on a policy of contraction.

I believe it must be a policy of expansion. We must keep industry going. We must keep our business going, if we can, after the war needs are supplied.

We are all under the same banner of "Win the war." We have an honest right to differ as to how it is best to win the war. We have a right to differ with those in authority, if we can point out constructive things that should be done to take the place of some of the things they propose.

Conversion; Not Destruction

So, if we cannot have our business going as usual, then it is just as necessary—and all of you probably will agree—it is just as necessary to make dollars as it is to make munitions to properly finance the future conduct of the war.

So, as I say, the Automobile Industries Committee has been appointed and is serving in Washington as the intermediary between the Government and this vast industry employing nearly one million men and with the great capital that it has.

We are the go-between to say to that Government, we stand ready as patriotic business men to convert this industry as much as may be necessary to be of assistance to our country in making its war program, but we want conversion and not destruction. We want and are willing—while you dealers do not like to hear this and it is not going to come to pass—we want and are willing, and have said so repeatedly, that if this Government needs it, it can have 100 per cent of the automobile productive capacity of this country, if it needs it, to win this war.

They are not going to need 100 per cent of the automobile capacity. The automobile industry has already taken on a large number of war contracts, but I do not believe for one moment that it is going to interfere with the production of automobiles; at least very much below the point of where the sales will be.

I do not believe, as an automobile man, that we can have in this country during a period of four or five years' war 100 per cent of our biggest year in sales. I would not be telling the truth if I did not tell you that.

With two or three million men, and probably five million men, on the other side, taken out of production, taken out of activity here and put "over there," I do not believe we can expect to pyramid this production year after year, as has been done, during the period of this war.

We all want to make our business go, keep it alive, and we want to keep going as much as possible, but remember that this

is not a money-making period necessarily, but it is a history-making epoch that we are in.

So I have no patience with the man who is disgruntled, who is dissatisfied, every time that something happens that unsettles his business.

As far as official Washington is concerned, there is no disposition on the part of any official that I know anything about, or that our committee has been dealing with, to deliberately injure the automobile business or any other business. Their motives are just as high as yours and mine. The only difference between us is method, if you please. It is method.

Now, then, we are down there to represent the industry for the purpose of convincing those gentlemen that they do not want unnecessarily to curtail this industry, the third largest, or any other industry, and, as I say, I don't think it is going to be necessary, because they understand themselves now that the automobile business is somewhat of a half public business.

You men as dealers, and we as manufacturers, have got a lot of publicity in the past for the automobile because—and that very publicity that you worked so hard for and got so much of in a time like this often works against us—there has been great exploitation of the great profits made in the automobile business.

Those in the business know that that can be limited to ten or fifteen producers. Those enormous profits have not been made by the great bulk of the people in the business.

If there is any one word that ever has done great damage to the automobile business in the last five years, it is the word pleasure. We are not making pleasure cars to-day. We are making passenger cars, and every dealer and everybody ought to realize that.

We have suffered for our sins in the past in calling automobiles pleasure cars.

In other words, gentlemen, there were some men in Washington who thought honestly of automobiles or passenger cars in terms of limousines. They thought they were all pleasure cars. They also thought in the terms of joy-riders. We had to convince them that all automobile men were not joy-riders any more than because you have a few people here in your city jail all of the people in Cleveland are just like them.

So we must get this pleasure car business in its right place.

What is the great crying need of this country to-day? As we point it out down there, the great need in this country to-day, the reasons for our five-day shutdown, is not scarcity of coal. It is not that. There is plenty of coal in the ground. There is plenty of coal mined. The mines only work two or three days a week now because they cannot haul it. It is transportation.

Now, gentlemen, our industry is just as much a part of the transportation system in this country as our railroads and steamships and trolley cars. The automobile business is just like one great big huge power plant divided up into individual units for the individual use of the people in taking them around. What we must do is to make the people realize that. It is not a pleasure car.

Transportation Needs Cars

The problem of transportation, perhaps, is one which will always be with us until we get our railroads reorganized, and we are paying now in this period of congestion for the first of the sins of the last ten or fifteen years in trying to run these railroads too much ourselves and to keep from them revenue which should have been furnished for the development of their roads.

I do not absolve the railroad from all blame. Perhaps they were not properly managed in certain places.

But if there ever was a time when the automobile necessity is being decried or being depreciated it is the very time when we ought to rise to the occasion and say, "Here is the third largest industry supplementing the railroads which have practically broken down in this country."

We have a great proposition in transportation, and you gentlemen want to look upon it in that light. Now, what made this automobile business great? In the past you fellows have patted yourselves on the back and said you were responsible for the tremendous business that was done.

Do you know that this automobile demand has been in existence for 2000 years, because the only way a man had of increasing the speed of his personal transportation has been by the automobile, and the only way he had for 2000 years was the horse and his own legs.

It was not until the advent of the automobile that a man could increase his own efficiency and thus increase the value of his time. There was a demand. Suddenly it became possible. It became commercialized. It became a commercial proposition where a man could buy it and use it, and get somewhere, and know he could come back in a short space of time.

The result was we tried to fill a 2000-year demand in ten years and therefore gradually the production increased and we got to patting ourselves on the back.

There is just as much demand for improved individual transportation as there was for improved community transportation. Railroads are community transportation. Trolley cars, community transportation, steamship community transportation, but the automobile is just as much a part of the individual system as it is of the community proposition.

So, let's get our business right in our own minds. You men have no right, if you are business men, and I am convinced that you are all good business men or you would not be here—if you have the pep you ought to have, if you are made by the stuff that I think you are—you have no right to become discouraged about the automobile passenger car business.

As an individual if I were selling cars to-day and a man said to me, "I don't want to buy a car now because it is war time; I want to wait until later," why, I would tell him that that is the very reason he needs one because now you have got to be 100 per cent efficient; you must have the latest improved efficiency methods or you cannot be in the pink of condition. That is the very reason he should buy a car.

Then, another thing that we must all get into this spirit of this proposition: If you men feel that your business is not going to be right, if you feel you cannot sell cars, well, then, God help the men under you because if you, the heads of businesses, feel that way, then do not blame the fellows under you, especially the salesmen, because a good deal of this present automobile talk is psychology, notwithstanding some ridicule was made of the word psychology in connection with the business depression in 1913 and 1914.

If you have a salesman working for you and he calls on this man, and then a second man, and the third and fourth, and possibly the fifth man, and they all tell him that they do not believe they will buy a car just now, or they will keep their old ones for this season, why, then, he begins to believe them, because if you tell a man something often enough he will begin to believe it.

That is psychology, and you fellows have got to keep your forces keyed up; you have got to keep your men in that condition, and the way to do that is by having more meetings of your organization.

You ought to meet your men once a week during this period, get them together and help them answer these objections, give them the pep which you alone can give them, show them that you are a leader, that you are deserving of the name and you are not discouraged.

Demand to Be Great

On the other hand, there is going to be a demand for automobiles in this country. You can't stop it. There is going to be a great demand for automobiles.

The farmers were never so rich. Their business is going to be good. These billions of dollars which have been subscribed to the Liberty Loans have come from stockings, from socks and from safety vaults, and the Government is spending them here and there and everywhere, and they are going into the arteries of trade. We cannot have business as usual, but we will have good business.

We cannot have everything just as it was, but we are going to have good business in this country.

And after all, gentlemen, there is no man in this country if he gives to the next five Liberty Bond subscriptions who is going to give until it hurts. There are very few Americans to-day who are giving to either the Red Cross or buying Liberty Bonds until it hurts. They have always something in reserve. I will qualify that. Most of them have.

So, gentlemen, it is our duty to subscribe to the Liberty Bond campaign. Every one of you has to go over the top more than 100 per cent. We have to give to the Red Cross. It is better to contribute to the Red Cross now than to pay tribute to the Iron Cross later.

You gentlemen have to do all these things. Yes, and in addition, gentlemen, we have got to do business too. We must do business. We have got to buy and we have got to sell, and we have to give in trade, and we have got to be level-headed business men. We have got to do these things.

You men in your towns, in the automobile industry, it occurs to me, can do a great deal to help this. You must get together in your organizations more, in your automobile organizations.

Instead of talking about the most beautiful lines or the most beautiful this, that or the other thing, why don't you get together and pay for some copy of the right kind that will point out to the people what automobiles mean to them?

If your dealers in Akron, for example, got together and you had twenty-five of your leading doctors sign a statement that says that the automobile that they have been using for the last eight years has quadrupled their efficiency and they now see twenty people a day where they used to see five—that is the kind of advertising the country needs to-day about the automobile business. We must make the people see what a wonderfully economic thing it is.

Gentlemen, if the Congress of the United States should pass a law that after to-morrow no more automobiles would be allowed on the highways or the streets of the cities they would set the country back fifty years economically, and they would be sure then that we would lose the war from within and not from without.

Has to Have a Car

It is often said to appreciate what value a thing is to you, you must be put in the position of doing without it. Whenever a man comes and says to you that an automobile is a luxury, tell him as I told a man in Washington the other day, a high official. He said, "Mr. Chalmers, I do not think automobiles are necessary; I believe they are non-essential at this time."

I said, "You use one, don't you?"

He said, "Yes, I do."

I said, "Well, now, suppose I came along to you and made you a proposition like this: I will take that car off your hands at what you paid for it if you will sign a contract with me that you will never ride in an automobile during the period of this war, would you do it?"

"No," he said, "I have to have one."

"Yes, you have to have one, but you want to deny the other man in a similar position the privilege of getting one."

That was the situation. He had to have one and he did have one because he was going around the departments, and after all we are proud to talk as business men about this thing of efficiency, and we talk a great deal about it. What is it?

After all, how did you make your money? You made it out of three things. You made it out of knowledge you have of the particular line you are in. Second, coupled to that, you make it out of your ability to use your knowledge, and the third is the time you have to apply to the other two. That is about all there is to it.

If I can double your time, get you some place in 8 min. where it used to take 28, I have made you three times more efficient. I have made it possible to use that ability and that knowledge three times as much as you otherwise would use it.

So that is the idea of this thing. It is to get the right kind of publicity. Now, this is true. Every man pays for the thing he needs whether he buys it or not. If you need an overcoat you will pay for it whether you get it or not. You may pay for it in doctor bills; you may pay for it in a cold all winter. You may pay for it in crippled efficiency. You will pay for it. You had better go down immediately and buy it, because you will pay for it in the end, anyway. If you need an adding ma-

chine in your business and you do not buy it, you pay for it just the same.

The same thing is true of an automobile. If you need an automobile or a passenger car in your work, you pay for it whether you buy it or not. You pay for it. We want to get those thoughts across to the people. Instead of your salesmen being discouraged, they ought to feel encouraged.

Now, then, as your chairman said, there is going to be more or less trouble. I tell you, gentlemen, I think the President of the United States should do to-morrow and not the day after to-morrow this:

He ought to do it to-morrow, he ought to conscript every man in the United States up to fifty years of age and make them all soldiers of Uncle Sam and then tell them whether they are to serve in the industrial army or in the national army in France.

There is going to be labor trouble, not union labor necessarily. It is non-union labor just as much. This is not a time when any man has a right to say he won't do this or that. If he does not want to work in a coal mine, if he does not want to work in an automobile shop, then let him go over to the trenches in France.

We have got to get the spirit of this thing. We must get it, and I think we have it all over this country. I believe this five-day shutdown, if you please, had this one beneficial effect, it has waked up a lot of people in the Middle West and out West particularly who are not close to this thing.

It has waked them up and made them realize we are at war with Germany. There is no use of our fooling ourselves.

I personally think you can look for an order from Washington restricting passenger traffic, and I would not be surprised if they shut down all passenger traffic in this country for one week, and I hope to God they do, because, gentlemen, if we could have a suspension of passenger traffic for one week, can you realize what an immense amount of freight could be moved by those engines?

Mileage 500 and 600

However, I hope they will notify us in advance so that we can get where we want to be and stay there. We would not necessarily stay there because we have automobiles and we can go up to 500 and 600 miles.

But isn't it better to have those orders for one week's duration and put all of the locomotives into service toward lifting freight and untying this thing than to go along five or six months in this crippled condition?

These are drastic things and these are drastic conditions.

Personally, if I had charge of the coal administration I would not have permitted it to come to this present condition, but that is not necessarily a reflection of the men in charge. I do not know all of the circumstances, but we know this, there is no possible excuse, gentlemen—I am measuring my words and I know what I am talking about when I say this—there is no possible excuse for a repetition of it because they told me in Washington at the Fuel Administration that it is estimated that we can take out 600,000,000 tons of coal a year for 2000 years and not use up our coal supply in this country.

Now, gentlemen, it comes down to this point then: It comes down to men. Men. Not even transportation. I would conscript every man up to forty-five or fifty, and here is where our great industry comes in.

We should have dealt with this fuel crisis before this thing broke.

I believe if they would commandeer 100,000 trucks in this country, which is possible, that they would go a long way toward solving this coal proposition—commandeer them. We are at war. We have a right to commandeer anything if this Government has the right—and thank God it has—it is not a right—it is a privilege, to send your boy and my boy over to France. Will any American say it hasn't the right to do with physical property what it pleases?

The 100,000 trucks would help to do what this great industry is bidding for the chance to do. This industry gave this country Howard E. Coffin and Christian Girl. They have not gone down for the dollar, but because they have the spirit we

Every man in this room who is in this automobile business must feel that he is doing his duty. We cannot all go to France because of the age limit and for other reasons. This war

is not one-sided. It has to be divided about 75 to 80 per cent industrial and about 20 to 25 per cent actual fighting.

The man who stays in his place here and remains sober, and does his daily work, with the God above looking on him, doing it conscientiously, is producing more than he ever produced before, is supporting every endeavor, is subscribing for Liberty Bonds, to the Red Cross, and all the others, is just as much a proper and a faithful citizen of this great Republic as if he put on a uniform and carried a gun in France.

So let's do our duty. Let's not get down in the mouth about this automobile industry. Your duty is to sell cars. Your duty is to keep supplying this demand for not a non-essential at all, but for an essential.

I do not believe there should be any such things as essentials and non-essentials.

So we must go away with this spirit: Do not be downhearted when you go to the next man after this. Do not feel like apologizing to a man when you approach him to sell a car. Approach him as you did heretofore because you are rendering a real service in doing so.

Why, if all men had that attitude with reference to their business we could not win this war at all.

And for God's sake, men of this country, do not talk about peace. We can have no peace with that bunch in Germany to-day. Did not Russia try it the last four weeks? What kind of a peace did they want to give them after all? Annexation of all the territory they had and a standing army to remain there indefinitely.

No, gentlemen, leave the peace proposition to those who handle it and the President of the United States is certainly handling the diplomatic end of this business in an admirable way.

Let's not talk peace. Let's go on, every man to his job, shoulder to shoulder. Let's forget peace, let's forget all strife among ourselves because we are fighting now so that the orator in forty or fifty years from now can stand up and tell our children and their children the acts of heroism and the great sacrifices we made, as did our forefathers who went down in order to give this wonderful country we enjoy to-day.

We won't get the benefit, but our sacrifices and our work will be heralded down for ages to come.

It is up to us to prove as American men by our work, by our staying on our jobs, by our optimism rather than pessimism, that we are worthy of the heritage we received when that flag was handed down to us to preserve and protect by our forefathers who fought the same kind of fight that we fight now to preserve it.

So, gentlemen, do not get discouraged. We cannot win this war with crepe on our noses. We cannot win this war by going around with sad faces. We must win this war, gentlemen, with our souls.

We have to put our souls in first.

We have to realize that all the money we have is not worth a tinker's dam to us if we do not win this war.

We have to put aside all our selfishness. We have to obey orders when they come. We have to counsel and advise before the orders are issued, so that they may be issued intelligently and profitably, but after they are issued, let's get down and obey them.

Must Win the War

We must win this war. We have to do it this way. We have to be right spiritually. We have to be right physically. We have to be right morally. We have to be right financially, and we have to be right industrially. We must have all those things.

I do not think anybody has any right in the automobile business to feel anything but glad and happy because he is going to be allowed to continue.

There will be no curtailment of automobiles.

Nothing like that is contemplated, and if we would most help this Government in war work, we have got to be let alone with our potential strength of organization to do this work for it, and at the same time to do our part in solving the transportation problem.

Let us fight, fight from now on. Let no man put his heart now on any premature peace talk.

We do not want anything but 100 per cent in devotion of souls and mind and body to the work of this country, and our praise—if there is any—we will probably never get, but our children after us will rise up to call us blessed.

Motor News of Foreign Climes

Australia Faces Genuine Car Famine

SYDNEY, AUSTRALIA, Dec. 15—Australia is facing a genuine motor famine, which is due to a variety of causes. The loss occasioned by different embargoes has reduced the number of motor cars reaching this continent, but there is still another difficulty, namely the trouble of getting pneumatic tires. Goodyear has done an immense business in Australia but owing to shipping difficulties has not been able to keep its stocks here equal to the demand. The tire situation is further aggravated because local rubber companies have suffered production losses due to a labor strike which has been in force three months. The work of the local rubber companies has been further interfered with by a difficulty in securing raw materials for tire manufacture.

It is unfortunate that at this time there should be a shortage of cars and a shortage of tires, because the farmers are getting large returns for their labors. They are getting good prices for their wheat and their wool, and the guaranteeing of these prices puts the Australian farmer in a class of being the most prosperous buyer to-day. Crops are particularly good, and farming conditions give promise of being the best for years.

One aspect of the shortage of motor cars in Australia is the enormous increase in the price of used cars. There are many used cars of both American and European origin selling at a much higher price than they originally sold as new machines. This is helping the dealers out very materially.

So far Australia is not confronted with any gasoline famine, in fact no fear is expressed at this time of any fuel shortage.

Jellinek-Mercedes Dies

PARIS, Jan. 23—A news dispatch announces the death at Geneva, Switzerland, of Emile Jellinek-Mercedes, the man who is responsible for the name Mercedes in the motor car, aircraft and motor boat industries. Jellinek was a wealthy Austrian who from 1880 to the outbreak of the war resided at Nice in Southern France

and acted as Austrian consul there. Nice being a mecca of the wealthy classes of all nations in winter time, the motor car made its appearance there at an early date. About 1900 Jellinek secured financial control of the Daimler Motor Co. of Caunstatt, Germany, and he claimed credit for having inspired Mayback, chief engineer of the Daimler works, with the idea of building a light and powerful chassis. This chassis, of 40 hp., weighed less than 2200 lb., whereas the 1899 Daimler model of 28 hp. weighed about 4000 lbs. The car was named the Mercedes for Jellinek's daughter and when the success of the machine made the name world-famous Jellinek had it added to the family name.

At the outbreak of the war Jellinek-Mercedes had to leave France and sought refuge in Switzerland. There he was arrested last October on a charge of espionage but immediately was released.

New Body Restrictions

NEW YORK, Jan. 25—The Australian government has made an additional ruling with regard to the shipment of motor car bodies from America to Australia, which extends for three months the time in which bodies can be shipped from America to Australia without being fitted on their chassis or accompanied by additional

chassis. The new ruling states that bodies may be shipped from America up to March 31, 1918, which is really a three-months' extension. This information, given out by the Australian Department of Trades and Customs in this city, is really the fourth step in the program with regard to prohibition of motor car bodies, which started Aug. 10. The absolute prohibition placed on the importation of bodies into Australia at that time proved embarrassing because body builders in Australia were not able to cope with the requirements and a famine of bodies was precipitated. The ruling was modified so that a complete car was admitted, provided two additional chassis were imported at the same time. Now the final ruling extends the period of receiving bodies without any restrictions whatever, provided they are shipped from America prior to March 31.

490,000 British Cars

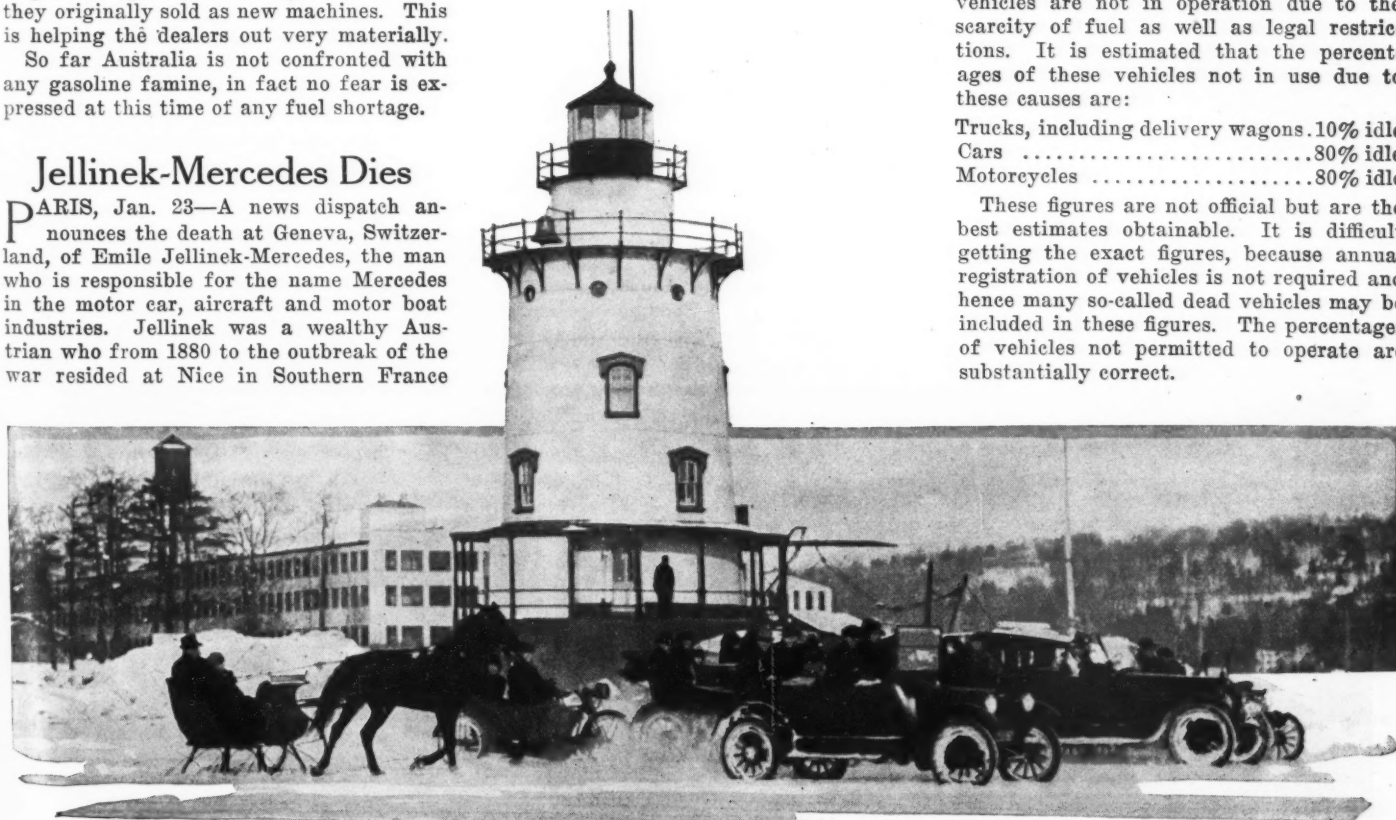
LONDON, Jan. 23—By cable—There are approximately 490,000 motor vehicles in Great Britain to-day, made up as follows:

Trucks, including delivery wagons..	40,000
Cars	250,000
Motorcycles	200,000

These figures include vehicles in government use as well as those in private service. A considerable percentage of these vehicles are not in operation due to the scarcity of fuel as well as legal restrictions. It is estimated that the percentages of these vehicles not in use due to these causes are:

Trucks, including delivery wagons..	10% idle
Cars	80% idle
Motorcycles	80% idle

These figures are not official but are the best estimates obtainable. It is difficult getting the exact figures, because annual registration of vehicles is not required and hence many so-called dead vehicles may be included in these figures. The percentages of vehicles not permitted to operate are substantially correct.



Tarrytown is making the most of the frozen Hudson river by using it for motor racing. This is the start of such a race, in which cars, a motorcycle and a horse-drawn sleigh competed. A car won

In the War Zone of the Veldt



Converted Daimler cars on rails, with a heavy load of goods and passengers. They were photographed in the British African campaign

GASOLINE, or petrol, as it is called in the Union, is at present \$1.10 a gallon, but it has always been expensive, and for the last two years has been over the 75-cent mark. Pegasus and Texas are the best known brands. There is a good sale for petrol-saving devices, such as extra air attachments for the carbureter, and most motorists who have to economize have an extra air device fitted. Automatic gasoline supply stations are fitted up at most of the larger garages.

More than a 100 per cent increase has to be reckoned on tires retailed in South Africa. Tires are the most troublesome item to the garages, as it is a known fact that the original sets sent out with a consignment of cars do not wear nearly as well as tires from the stock of the agents. This is probably due to bad storage on the boat. A tire life of 4000 miles is considered a good average for South African roads.

The tire from the U. S. A. has a very good name, and trade in the British and

American product is now about equal. Owing to the war the market slowly is getting into the hands of American manufacturers. The Dunlop Tyre Co. has a large percentage of the trade at present. Bates and Avon are the only other British competitors. Goodyear, Goodrich, United States, Fisk and Firestone all are well known. Goodrich has the largest share of the trade in American tires, but the United States agency has just been taken up by a very progressive firm, Bartle & Co., whose head office is in Johannesburg. They are advertising largely and evidently are campaigning to get a large slice of the trade. Tires have to be stored specially in darkrooms, being kept separate, as the rubber soon perishes in the dry African heat. Solid tires have not been a success except for heavy commercial vehicles, owing to the bad state of the roads outside the cities.

Most cars in use in South Africa are of the touring type. Sedans and landaulets do not sell. The intense dry heat soon

Motoring Possibilities in the Union of South Africa

In Two Parts—Part II

destroys the body work, and the purchaser wants a long distance car capable of giving maximum coolness in the hot climate. Private electric vehicles have been taken on to a certain extent for town work, but their present limitations are recognized.

Cape Town leads the way as regards purely commercial vehicles, both gasoline and electric, the other towns of the Union steadily coming up in this respect. The commercial vehicle garage business is a big one and capable of even more development than the car business, as over here most everybody can see the advantages of a motor car, but it has to be proved to the commercial prospect that the lorry, as the motor truck is called throughout South Africa, is going to do the work done by his horses and cart more cheaply and efficiently. Most of the big companies in the cities are just beginning to realize this, and the various government and civil service departments, although generally considered unprogressive, have led the way. The government railways have for the last fifteen years used steam and mule transport for their delivering and collecting work. In 1915 they gave up the mule wagons at their Cape Town depot and now have a fleet of electric and petrol trucks of from 2 to 10 tons, the steam traction engines being worked out and discarded. Johannesburg and other railway centers are doing away with their old transport, owing to the success of the Cape Town venture.

The main postoffice in Johannesburg has just purchased a small fleet of twelve Milburn light electric vehicles as collecting vans to take the place of an equal number of Rudge Multi motorcycles and side carriers that had been in use since early 1914. They cost \$2,500 each, including the special type of bodies required by the



This is a part of a fleet used in training men for the motor transport corps at Pretoria, South Africa. Long rows of garages house the cars, which, in this case, are those of a Ford convoy

postal department that were made by a local carriage-building firm. The use of this electric fleet by a civil service department was good for the Milburn company and the General Garage, its agent, who incidentally is agent for the Dodge and Franklin. Some of the large delivering firms have given up their motorcycle carriers and lorries and are using electrics. This popularity is due partly to the excellent system the General Garage has, halving the upkeep cost on a motor. For \$35 per month it undertakes to garage, charge and do minor repairs to the vehicle it has sold whenever it is brought to the depot, and until the cost of gasoline and tires decrease materially it is certain that for commercial work in South Africa electrics will continue to attract customers.

Electric Trade Large

So large has the trade in electric commercials become since the middle of 1915 that the General Garage has started a battery distribution system for all the principal towns in the Transvaal to encourage the use of electrics for interurban communication. Away from the city areas the villages and towns are never less than 40 or 50 miles apart, and as the vehicles that have been brought to the Union are only capable of doing 70 miles to the charge there must be depots at every village on the main roads. The scheme to be tried out is that of selling the electric without any batteries, but supplying a set of batteries at its own cost to the purchaser, to remain its property. When once the charge runs out the customer returns the set to the nearest depot, getting in exchange a newly charged set at a nominal cost of about \$1.50 for charging, which works out at much less than the cost of gasoline. This scheme is being put into operation now and as far as it has gone gives signs of being successful. If it is the electric will be established firmly as a commercial proposition in the Union. The idea is to cover the whole Union, but it is only being tried out in the Transvaal.

The Union of South Africa has a population of 600,000 engaged in farming and agricultural pursuits and in trading direct with the farmers in the smaller towns. About 500,000 of these are Boers, for the most part unprogressive and ignorant. Although a large number of Boers from the towns and farming districts are fighting for the Allied armies to-day, there remains a certain section who hate their conquerors of the war of 1900. They would like to keep the country a closed one and cannot see that they are far better off under the



Here is a typical level crossing in South Africa. This kind rapidly is being superseded by proper gates and booms, however

wing of Great Britain, ruling themselves, than in the impoverished republic of Paul Kruger in 1899.

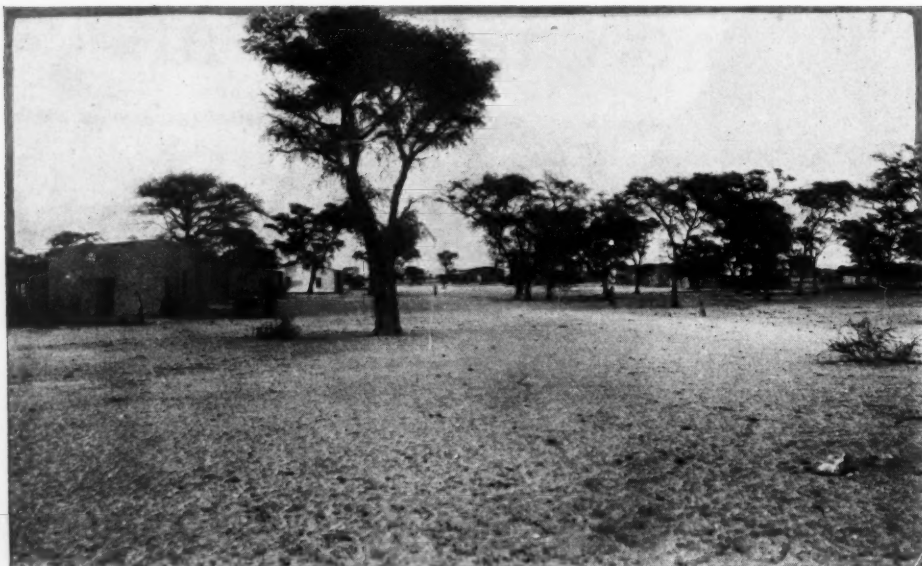
However disinclined the Boer may be to do business with the British, he likes the American individually, and this is one of the reasons that American cars are so often seen in the outlying districts. The language of the Boer is a corrupted Dutch mixed with a few native words, easily learned and taught in the schools, together with English, as the result of a bi-lingual

law enforcing the use of both languages for the South African, whether of English or Dutch parentage. English is spoken in the larger cities. The Boer persists in talking his South African Dutch until he finds you are really from America, when he will talk in broken but easily understood English.

Selling to the Boer—a Dutch word meaning farmer but now generally used to cover the whole Dutch population of South Africa—is very like selling to the more unprogressive farmers in the faraway parts of America. There is the wife to please, and she is the real boss and banker. Credit is risky, the Boer wanting it whenever possible, giving promissory notes for the amount. Notes that have been backed, endorsed and discounted three times frequently are taken to the banks to discount. With the farmer the motor car must look its value, and if he wants one it is a case of first come, first served, as almost always the first arrival proves his car best, except when the Boer's neighbor has a car that has proved itself, when it is difficult to persuade him that any make can be as good. He is quite content, and it remains for the car salesman to sow the seeds



A street in Kilindini, a typical small town, the landing place for the troops of the Union of British South Africa



The newly conquered German West Africa is mostly sand and desert. The road going through the village scarcely can be seen



The Shamoia mine, Rhodesia, the richest in Africa. It is 61 miles from Salisbury by motor car. Note the rutty road

of discontent by selling his neighbor a motor car first.

To sell a farmer a car the need for demonstration is real, and it is generally a demonstration in itself getting to his farm. The following is an example of how easy it is to impress him with any concrete fact. Some little time ago, in 1914, the Studebaker was being demonstrated throughout South Africa. A touring salesman called on a well-to-do farmer who was considered a prospect and after the usual preliminaries got to the demonstrating point. There is usually a kopje—pronounced kop-pa-or—small hill the farmer selecting the one to be climbed. He got in and the car did climb it, on second gear too, although that fact weighed little with him.

"A Sturdy Beggar"

"What did you say the name of the car was?" asked the Boer.

"Studebaker," he was told.

"You're right, man, it is a sturdy beggar," was his reply. He bought one.

For his repairs the farmer relies entirely on the nearest town or village, often 50 miles away, so that it is vital to the

success of any car endeavoring to get an agricultural clientele that agencies or branches are set up in the principal villages in the district. The farmer himself is not mechanically inclined, but his eldest son usually interests himself in the car and is able to mend punctures and make small mechanical repairs.

Farms are large in the Union of South Africa, and appearances are deceptive. What at first sight looks like a hovel, built with galvanized iron—frame houses are not popular, due to the ants which destroy them in two years—turns out to be the abode of a wealthy farmer. It is just a house on the bare veld, with a few trees around it, maybe, and no boundaries in sight, and perhaps even no signs of cultivation if it is a stock farm. Quite an ordinary farm comprises 10,000 acres, the stock farmer going on a principle of a sheep to an acre.

The sale of farm tractors is increasing steadily in the more progressive districts of the Cape Colony and Transvaal and taking the place of the primitive method of ploughing by oxen.

Until the advent of the motor car the

ox-wagon and Cape cart were the only means of travel besides the railroad and government coach. They are universally used still by the farmer, the ox-wagon with its span of from eight to sixteen oxen being for heavy transport, taking produce to market, etc., and the Cape cart with its two horses or mules for passenger service. The motor truck in time will take the place of the former, and the touring car at present is taking the place of the latter in the outlying districts.

Motor cars are being used by the government and public service companies in the country districts for connecting distant villages with the railroads, the vehicle most used being the Ford. The government service in the Cape province connecting the Hermanus district with the railroad is an extensive system, big motor omnibuses being used. The Ford has a good name for country work, due to the bad state of the average roads and the way a light car can travel over them. Rail cars built on the same lines as a street-car are used on the branch lines of the railroad for this work. They are gasoline-driven, of 16 hp. and capable of taking a light truck or two in tow.

In the remote villages and towns 70 or more miles from the railroad, taxicabs ply for hire, mostly Fords, some of them 1912 models. A day's trek for a wagon is 20 miles and for a motor 80 miles.

The men of the black tribes inhabiting the Union cannot be compared with the negroes of the U. S. A., as they are almost wholly uneducated, and for the most part savages. Several kings and chiefs of tribes possess motor cars, and a few natives in the towns are educated sufficiently to be able to use them. There are two native reserves, Swaziland and Basutoland, set aside for the use of the tribes of those names in the same manner as the Indian reserves here. The reserves in the Union are under direct supervision of the British government, the Union government having no authority.

A Conquered Nation

The Basuto is different from the Zulu, Matabele and Swazi, the great native nation of South Africa, inasmuch as his is an unconquered nation and has never once clashed with the white man in war like the hordes of Chaka, a former king of the Zulus. Being very well behaved, the British government has given them 10,293 square miles of the most fertile part of the Union, that lies between the Transvaal and Natal and has on its borders the most beautiful scenery of the sub-continent. The native population of 347,731 makes its living by cattle raising, growing kafir corn, or millet, and wheat, and selling the produce to the Union. Maseru, the capital, which is really a collection of huts and is called a kraal, has a population of 1300. The Basuto chiefs have experimented with cars and found them to their liking, but the field is limited, owing to the very few natives sufficiently educated to use them. Jonathan, the king of the Basutos, has a good education, and a secretary, but he prefers to live in a mud hut in the royal kraal with his subjects. The white man can travel without fear through Basutoland, although the natives there are less courteous than in the other reserves, owing to the fact that they have never come into conflict with the white man and are apt to imagine themselves of consequence, though one could hardly call them insolent.

Swaziland, the other reserve in the Union, lies between the Transvaal and Portuguese East Africa, about 500 miles north of Basutoland. Through it runs the main road connecting the big Portuguese port of Lourenco Marques with the Witwatersrand gold-mining areas. In Basutoland are only a few white traders with concession stores, but there are tin mines in Swaziland worked by the Corner House, as the offices of the Rand gold mines are called. The chief town is M'Babane, which has a white population of about 1000, mostly officials of the crown under the royal commissioner, and the employees of the mines. Although the country is mountainous, the road is good from the Transvaal to the Portuguese territory, a distance of 300 miles. There is not a railway in the whole reserve.

The Swazis buy few cars, but for the last three years the Swazi queen has been declaring her intention of buying one. Time is no object to her, however, and repeated visits by car representatives have resulted only in promises. The old lady is a bit of a despot, and a visit to the royal kraal confirms the idea that she is a tyrant holding her subjects by fear. The British government rules the Swazi nominally, and as long as the whites are not molested the blacks are left very much to themselves. There is an occasional Swazi scare, when all the farmers get into the nearest village, but up to the present the continually prophesied rebellion has not materialized.

Taking advantage of the excellent roads between the two cities and of Pierce-Arrow reliability, Mr. Mink is offering a service to business men that is being eagerly welcomed. This is the first experiment on an extended scale in this section with a regular daily schedule of runs. It is planned still further to enlarge the service so as to facilitate shipment to and from New England. Arrangements have been made with a New York firm to have merchants ship from Boston to New York by water, and thence to Philadelphia by motor truck.

TO IMPROVE EXPORT SERVICE

Washington, Jan. 25—The National Automobile Chamber of Commerce through General Manager Alfred N. Reeves has asked for improved export service from the Department of Commerce. C. P. Carter, assistant director of foreign and domestic commerce, in consequence, is arranging to provide for complete business information of all foreign countries to the automotive industry. Mr. Reeves is preparing a list of the kind of information required, including road conditions, financial conditions, gasoline supply, motor supplies markets, kind of people who may be secured as agents, methods of business as regards cash or credit and so on. As soon as this list is compiled Mr. Carter will secure the desired information and will endeavor in the future to frequently supply the industry with additional data along the same lines.

FRENCH ENGINEERS TO MEET

Paris, Jan. 3—The civil engineers of France are to hold a congress at the Sorbonne, Paris, during March. The third section, which covers the entire question of transportation, has one sub-section dealing with the motor car industry. M. Lumet, who before the war was engineer of



Market street in Johannesburg, which is laid out on the draft-board system. Buildings of the steel girder type are common



The road shown here was made by the constant travel of heavily laden motor vehicles and is over the veldt proper

the laboratory of the Automobile Club of France, and who will be remembered as the first officer sent to America to purchase army trucks for the French forces, will present a paper dealing with "Industrial Questions: manufacturing, standardization, methods of work and of production." Henri Cezanne, who in peace days was general manager of the Paris Automobile Salons, and is still general secretary of the French Automobile Manufacturers' Association, has been scheduled to read a paper entitled "Commercial Questions: sale, exchange, customs duties, taxes, production combines."

An independent section is being formed to deal with touring.

LONDON MEETS TAXI TROUBLE

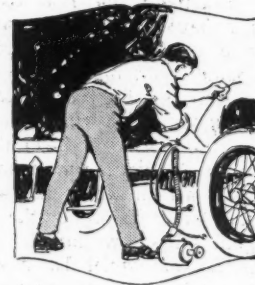
London, England, Jan. 1—After two months difficulty with taxicab strikes in this city, during which time only 1000 of the 3000 cabs in the city were running, it has been settled by the owners agreeing to

what has up to this time been considered beyond reasonable demand by the drivers. The new agreement not only allows for increased rate but the men are given free gasoline, which already has resulted in abuse in that the men are letting their engines run while standing by the curb and at official stands. It is expected that a complete revision of taxicab rates for the city will be accomplished and that a rate of 25 cents a mile for two passengers will take the place of the old rate of 16 cents a mile for two passengers. For the time being a flat increase of 12 cents a trip, irrespective of distance, has been allowed. Sentiment is opposed to the present flat increase, because a majority of the taxi trips by business men around London are short distance trips. Under the present schedule the unlimited use of the taxi by persons who cannot use private cars is favored under the new schedule, whereas those using the taxi on short distance trips in business are discriminated against.



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.



Editor's Note—Herewith is presented the eightieth installment of a weekly series of articles begun in MOTOR AGE issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained. A section on generator output was followed by one on the purpose and operation of the cutout. Electric motors and engine and motor connections then were considered. Ignition was taken up next.

Part LXXX—Installation and Care of Special Electrical Systems for the Ford Car

QUITE a few of the leading manufacturers of starting and lighting equipment for the larger car also make a special line of equipment which easily may be installed on the Ford car. These various special systems are, as a whole, simple and compact, and everything necessary to install them properly on the car is provided by the manufacturers of the equipment, and all that is necessary is a very limited knowledge of the car and the few necessary tools supplied as a part of the car equipment. The selection of an electrical system, especially when it is to be installed by the car owner or the local garage man whose knowledge of electrical systems is, as a rule, quite limited, is in a great measure influenced by the ease with which the system may be installed. In practically every case this necessitates the removal of the radiator, the radiator brace rod, hose connections to the radiator, ventilating fan, fan belt and fan pulleys, cylinder head and, in some cases, the timing gears. In removing the timing gears it is, of course, necessary to remove the timer, but before doing any dismantling both the carburetor and timer should be adjusted for efficient running, and should the engine be turned over while the timing gears are off, the timing must be readjusted when the engine is being assembled. The removal of all these parts and the adjustments mentioned are described fully in the Ford manual or instruction book, and also on account of the garage men being so familiar with the constructions of the Ford car it is not deemed necessary to repeat these instructions.

A very important precaution which should be observed before starting to tear down the car is to check over the list of parts sent with the outfit and those actually received. The reason for this precaution is obvious, as occasionally quite an essential part may have been omitted, and if this is not discovered until the process of installing the equipment has been completed partially the work must be done all over again or the car allowed to stand until the missing part or parts are obtained.

Gray & Davis for Ford

The two Gray & Davis systems for the Ford car are of the two-unit, 6-volt single-wire types. The generator of one system has electromagnetic regulation and the generator in the other system has third-brush regulation.

The order of procedure to be followed in tearing down and preparing the engine is shown in Figs. 439 and 440. Drain the radiator by opening the drain cock shown at 1 in Fig. 439. Remove the headlights and headlight supports shown at 3 in Fig. 439. Loosen upper hose clamp on lower water connection, shown at 4 in Fig. 439. Loosen the lower hose clamp on top the water connection, shown at 5 in Fig. 439. Remove the two radiator retaining nuts shown at 6 in Fig. 439. Remove the radiator dash tie rod shown at 7 in Fig. 439. The radiator is now free and can be removed. Next remove fan bracket and fan as shown at 1 in Fig. 440. Crank the engine until the pin in fan pulley is straight up

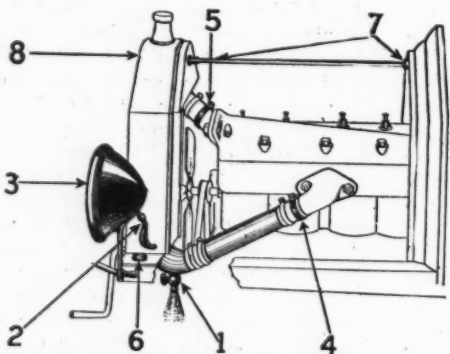


Fig. 439—Parts of Ford car to be removed in mounting Gray & Davis starting and lighting system

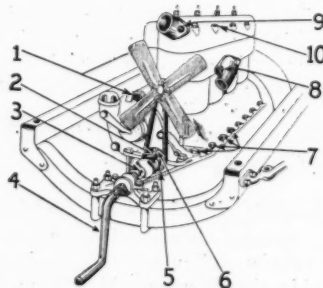


Fig. 440—Ford engine in process of preparation for mounting Gray & Davis system

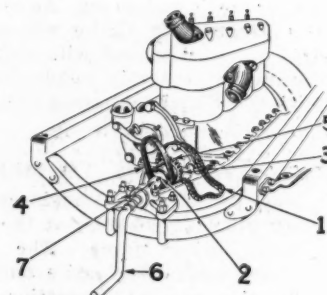


Fig. 441—Installing crankshaft sprocket, silent chain and fan belt in mounting Gray & Davis

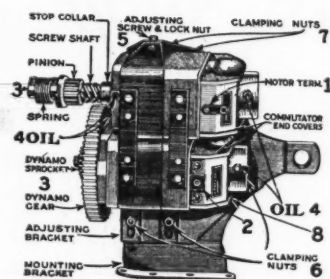


Fig. 442—Generator and starting motor attached to the mounting bracket

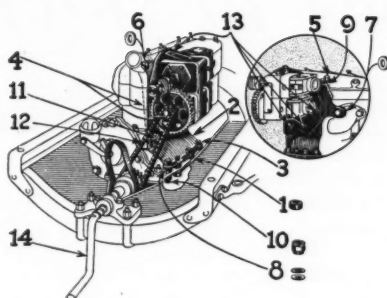


Fig. 443—Gray & Davis starting and lighting units mounted on Ford car

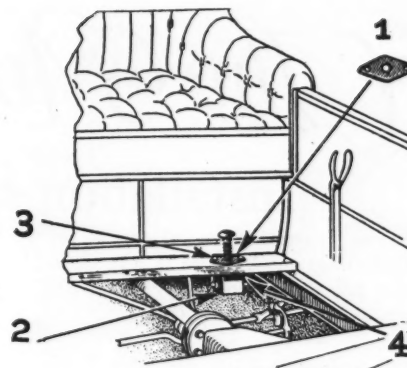


Fig. 445—Method of installing Gray & Davis starting switch on Ford car

and down, 2 in Fig. 440. Drive out the pin in the jaw clutch, shown at 3 in Fig. 440. Remove the starting crank, 4, and fan belt, 5. Remove the cotter pin and pin from fan pulley and then remove the pulley, 6, in Fig. 440. Remove the second, third, fourth and fifth bolts from the crankcase flange, shown by 7 in Fig. 440. Remove the front bolt 8 from the side water connection. Remove the left-hand bolt 9 from the top water connection. Remove the second cylinder head bolt 10.

Place the silent chain at the rear of the engine support and around the engine crankshaft, as shown at 1 in Fig. 441. Place the Ford starting crank jaw clutch inside of the crankshaft on the crankshaft as shown at 3 in Fig. 441. Slip the new fan belt in place. Fasten the sprocket to the crankshaft with the pin provided for that purpose, as shown at 5 in Fig. 441. Replace the starting crank 6 and fasten the jaw clutch to the end of the starting crank with the pin 7, as shown in Fig. 441.

The generator and starting motor units are shown attached to their mounting bracket in Fig. 442 and before attempting to install the combination on the engine the following inspection should be made carefully. See that the motor terminal marked 1 is free from contact with any other metal and that the generator terminal marked 2 is not damaged and is insulated properly. See that the various rotating parts marked 3 in the figure turn freely. Carefully clean off any dirt or dust from around the oil cups marked 4 and place a small quantity of oil in each of them. Release the top adjusting screw, marked 5, a small amount. Loosen the two lower clamp nuts marked 6, and also the two upper clamp nuts at the rear, marked 7. Slightly loosen the one middle clamp lock nut, marked 8.

The adjustment in the chain is taken care of by moving the generator and starting motor up and down on their mounting bracket until there is the proper tension in the chain and then clamping the two units securely in place. Inasmuch as the chain will stretch in service and this will necessitate the generator and motor being moved up on the bracket to take up the slack, it is

essential that they be placed in the lowest possible position on the bracket before being attached to the car.

Place three spacers $\frac{3}{8}$ in. long over the first, second and third holes in the crankcase flange, as shown at 1 in Fig. 443, and then place the mounting bracket 2 in position. Pass the $\frac{3}{8}$ by $2\frac{1}{2}$ inch bolts through the holes in the lower end of the mounting bracket but do not put on the nuts. Tilt the mounting bracket forward and slide the driving chain 12 into position on sprockets. Attach the bracket with a cylinder head bolt as shown at 5 in the figure but do not tighten the nut. Place the $\frac{11}{16}$ inch spacer between the mounting bracket and top water connection and bolt loosely in place with a $\frac{7}{16}$ by $2\frac{1}{2}$ inch bolt as shown at 6. Place a $\frac{11}{16}$ inch spacer between the bracket and the side water connection and bolt it loosely in place with a $\frac{7}{16}$ by $2\frac{1}{2}$ inch bolt, as shown at 7. Place $\frac{1}{2}$ inch spacers under the bracket so that the chain will be tight when the units are in their lowest position on the mounting bracket, as shown at 8. Shim up the space between the bracket and cylinder head with washers as shown at 9 in upper right-hand part of Fig. 443. Fasten the three lower bracket bolts with lockwashers and nuts and finally the water connection bolts 6 and 7 and cylinder head bolt 5. Fasten the bracket stay-bolt 11. Adjust the chain 12 to a moderate tension and lock the units in place by tightening all bracket clamp nuts, 13. Then crank the engine and see that it does not bind.

Attach the split pulley to the fan hub and fasten it in place with the four screws as shown at 1 and 2 in Fig. 444. Slip the belt in place and attach the fan, as shown at 3. Replace the radiator 4, replace the radiator tie rod 5, replace the hose connections 6 and bolt the radiator in place by the bolts at 7. Attach the lighting switch 8 to the cowl board with some $\frac{1}{8}$ inch screws. Cut corner off of the toe board and attach the green lighting cable clips to the dash with $\frac{1}{2}$ inch wood screws, as shown at 9 in Fig. 444. Fasten the three wire clips to the left-hand side of the frame as shown at 10. Fasten the green wire to dynamo terminal as at 11. If the generator has electromagnetic regulation the green wire is attached to the terminal on the regulator mounted on top of the motor. Then connect the short black and red wire to the left-hand headlight, as shown at 12. Pass the long black and red wire through the radiator tube 13 to the right-hand headlight. Ground the short wire from each headlight to the car frame as shown at 14. Connect the starting cable 15 to the terminal on the starting motor. This cable is marked by a copper terminal at each end. Refill the radiator and watch carefully for leaks in the circulation system. In connecting the black and red wires to the terminals of the lamp connection you should follow the diagram given in the upper right-hand corner of Fig. 444.

The location of the starting switch and the method of installing it are shown in Fig. 445. Take the plate 1 off the starting switch and use it to mark the holes in the heel board, 2 inches in front of the rear edge of the heel board and 9 inches from the sill, as shown in the illustration. Drill three holes for the starting switch in the heel board and attach the switch with one bolt at the side toward the center of the car as shown at 3. Then attach the other switch bolt, with the cable supporting clamp holding the two wires, and secure the spring and knob with its pin.

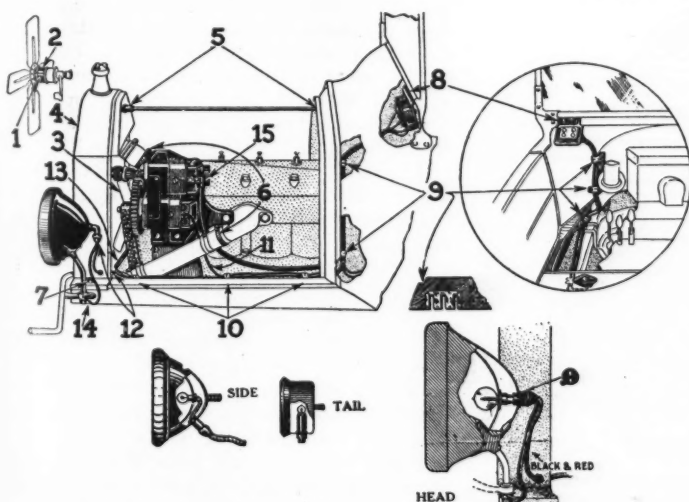


Fig. 444—Installing Gray & Davis wiring and lighting switch

The Motor Car Repair Shop

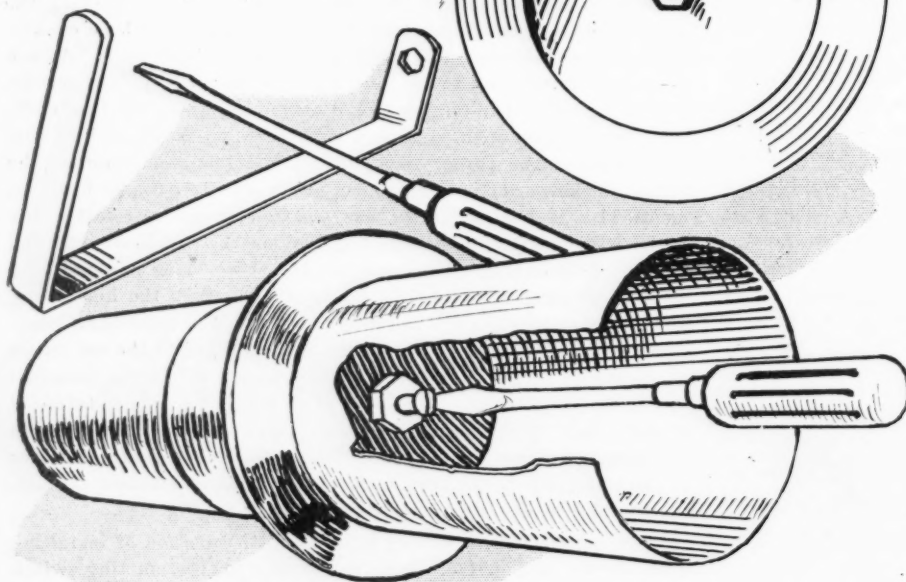
Installation and Adjustment of Stewart Horn

THE Stewart warning signal can be installed under the hood or in any other convenient place on the car but always should be placed so that the projector points straight ahead. The horn comes to the owner complete with bracket, 6 ft. double strand cord with terminals, push button, screws and nuts. The horn must be installed so that the oil hole is always on top, in the exact center, otherwise the oil will not be carried to and held in the oil well. If the car in which it is to be installed has an electric starter, connect the signal with the starter terminals on the battery. Do not connect to the terminals on the battery which lead to the lights. The lighting system usually has a much lower voltage than the starting system, and if the signal is attached to the former it will drain some of the battery. Determine also if the car has a single- or double-wire system, as this will determine the manner in which the horn is connected.

To Attach Horn

Attach the bracket to either side or the lower side of the flange on the signal. Remove three of the screws in the flange on the side where the bracket is to be fastened, and substitute the three long screws furnished with the outfit. Turn these screws down as far as possible.

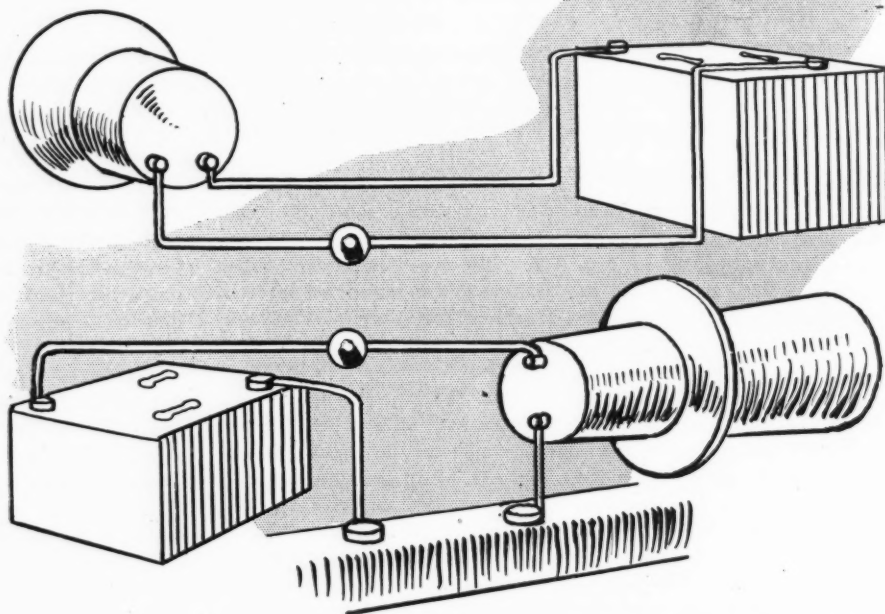
Two bracket screws with nuts and split washers are furnished for installing the horn. These can be used to install the device on the outside of the car, on the frame of the car or under the hood alongside the engine. The most desirable installation is under the hood on the engine.



Above, at right, looking into horn, showing adjusting nut and screw; below, tools necessary and manner of varying tone

On most cars the bracket can be installed on the engine by removing a waterjacket or manifold screw; place signal in posi-

tion so that the large hole in bracket lines up with the hole from which the screw has just been removed. Replace the screw



Two methods of installing the Stewart horn; top, two-wire or insulated return; bottom, one-wire or grounded return system

and draw it down tight. On Fords use the second waterjacket screw from front of the engine on left-hand side.

Wiring with Insulated Return

This is the two-wire system. One end of the electric cord is provided with copper terminal eyes, which are used for making connections to the screw terminals on the back of the horn. Remove the cap nuts, place the copper eyes on the screws and replace nuts.

To connect the push button remove 1/2 in. of the insulation of the remaining ends of the wires, leaving the wires clean, and place them through the hole in the side of the push button base. Loosen the two screws in the base; then loop the wires around screws and turn down tight.

To make the battery connection cut one of the wires in two, at a point where both ends of the wire will reach the battery. Remove about 2 in. of insulation from these ends and connect them with the terminals of the battery. Be sure to make this connection tight. It is important that these terminals be covered with rubber tape. Mount the push button in any place where it can be reached conveniently.

Wiring with Ground Return

This is the one-wire system. Make all the connections in the same manner as described previously, except connect only one wire leading from the push button. Then connect a wire leading from the signal to the steel frame of the car. This connection can be made with some screw or bolt already drilled and tapped. If possible, this connection should be soldered.

(Concluded on facing page)

The Accessory Corner

Pickups from the Chicago Show

Pines Radiator Shield

THE Pines automatic radiator shield is a shield devised to be attached to the front of a radiator and by thermostatic control shutters regulate the supply of air flowing to the radiator. When starting a cold engine the shutters remain closed until the water in the radiator reaches a temperature of 130 deg. Fahr. As soon as the cooling water reaches this temperature the shutter remains open to avoid over-heating of the engine. Price, \$22.50.—Pines Mfg. Co., Chicago.

Rand Spotlight

The Rand spotlight has a mirror diameter of 6¾ in. and uses the Rand reflector, the upper axis of which is inclined 2 deg., while the axis of the lower portion is horizontal. Both axis cross each other at a common focal point. By this construction greater concentration of light is secured, the dark rings and spots being eliminated, giving a long-distance light. Price, \$850.—Rands Mfg. Co., Haverhill, Mass.

Peck's Super Heat Manifold

The Peck Super Heat manifold is one in which the intake and exhaust manifolds are cast integral. Due to its construction the intake walls are heated by the exhausted gases from the engine. The mixture after leaving the carburetor passes up into this manifold and absorbs heat from the gray iron structure thus aiding in vaporization of the fuel. Price, \$7.50.—Peck's Super Heat Co., Elkhart, Ind.

G-P Muffler Cut-Out

The G-P muffler cut-out is designed so that when the valve is open the passage to the muffler is shut off completely. The deflecting angle of the exhaust passage is such that the exhaust gases can pass out as freely as possible and thus prevent the possibility of back pressure in the exhaust line. The cut-out is made in two parts thus enabling a rapid attachment. The area of the exhaust port is greater than that of the exhaust line, insuring complete relief of the pressure in the exhaust line. Prices, from \$4.50 to \$5.—G. Piel Co., Inc., Long Island City, N. Y.

Sasco Strainer

The Sasco strainer can be installed in any standard size gasoline line and is pro-

vided with a trap for the accumulation of any dirt that may be present in the fuel. It is constructed so that the strainer basket can be removed easily for cleaning. The trap has a drain plug located in its lower portion for the removal of sediment. Price, \$3.—Sage Brothers, Inc., Brooklyn, N. Y.

Garage Door Control

The Foss-Hughes pneumatic control for garage doors is a device for opening or closing any type of swinging, folding or rolling doors. The control board operating the doors can be located in any part of the building and the door opened and closed from this point. The apparatus operates by compressed air, which is admitted to a cylinder controlled through the control board. Thus the compressed air when admitted to the cylinder forces movement of the piston which through a linkage opens and closes the doors. Foss-Hughes Co., Philadelphia, Pa.

Ten Eyck

The Ten Eyck starting system is one adapted for Ford cars and operating on compressed air which is supplied to the

compressed air tank by a single-cylinder engine-driven pump. For starting the air is admitted to the cylinders through a distributing valve and in the same order as the firing order of the engine. It is claimed that a starting speed of 350 r.p.m. is possible. The air is retained in a tank carried underneath the chassis and is equipped with a night valve to prevent leakage when the car is to be laid up for any length of time. Air Device Co., Chicago.

ADJUSTING STEWART HORN

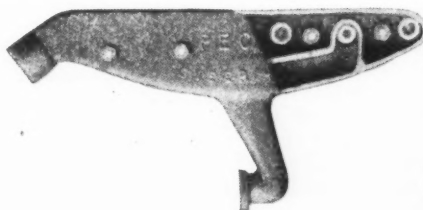
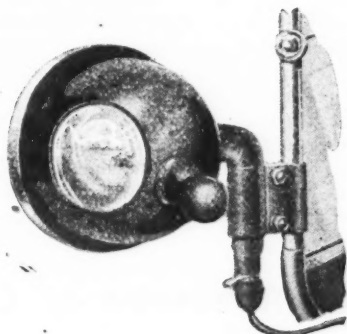
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If the tone of the warning signal should weaken, or not sound at all, it is due to the contraction or expansion of the metal because of atmospheric changes. All that is required to restore the tone is to adjust the sounding button in the center of the diaphragm, so as to bring it again in contact with the striking gear. To do this, first loosen the lock nut, which can be seen by looking down into the horn. Use the tool illustrated for this. After loosening this nut adjust the sounding button, which has a slot in the end. Use a screw driver for this. Turn the screw one way or the other until the desired tone is obtained.

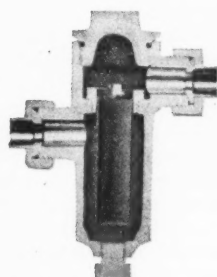
This is a delicate adjustment and care must be taken not to turn the sounding button too far to the left or to the right. Sometimes an eighth of a turn is all that is necessary. If the sounding button is turned too far to the right, the engine will stick or run slowly and a buzzing sound will be heard. After adjusting the sounding button, be sure that the lock nut is tightened again to prevent the sounding button from working loose.

To Lubricate the Horn

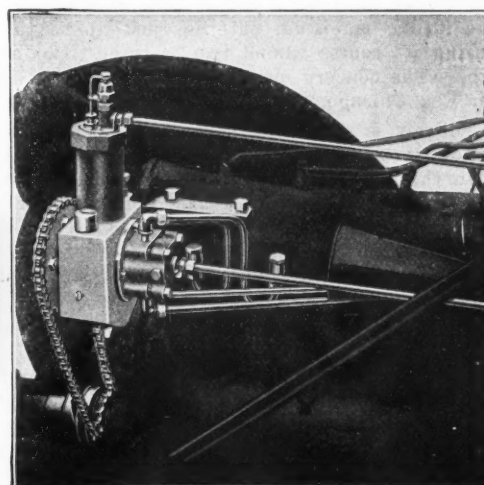
The shaft is the only part that requires lubrication and very little of it is required. Two or three drops of oil placed in the oil hole on the back of the horn once a month is sufficient.



Above, Rand spotlight and, below, Peck manifold



From left to right, Pines automatic radiator, Sasco strainer and G-P cut-out



Ten Eyck starting system installed

perature of 2500 deg. C. only 1.8 per cent of the amount of water present is dissociated and that the melting point of cast iron is between 1150 and 1250 deg. C. the fallacy of the claim seems evident. While still again the total amount of water reaching each cylinder is comparatively so small that its available oxygen, even if liberated, would be practically negligible.

Why is it then that this small amount of water tends to increase power and retard the deposition of carbon? To begin with we are all familiar with the introduction of water into the Diesel engines, which is done to inhibit the cracking of the heavy hydrocarbons, so the charge will burn rather than explode. Now the products of complete gasoline combustion are carbon dioxide and water, so that by the law of mass action if we increase the molecular concentration of one of these, the reaction will be retarded. Therefore it seems highly probable that the introduction of this water vapor into the cylinders will tend slightly to retard the rate of combustion. And by doing so the power of the explosion will be distributed more evenly throughout the stroke, thus giving a more prolonged and powerful impulse and at the same time allowing the carbon more time for complete combustion.

The foregoing theory is advanced more for the purpose of stimulating discussion than as a dogmatic statement, and I trust some one will either uphold my views or state his own, showing wherein I have erred.—C. W. Schwartz.

Auxiliary Air Device

Kentland, Ind.—Editor MOTOR AGE—My experience with air devices has covered a period of about six years. My first experiment consisted of drilling a $\frac{1}{8}$ -in. hole in the intake manifold of my Ford and stopping it with a small wooden plug. When the engine became warm I would remove this plug and considerable acceleration resulted, but having no control I found that this raced my engine needlessly and caused it to misfire at low speeds.

I next screwed a pet cock into this hole and controlled it with a stiff wire from the dash. This was much better but still very unsatisfactory on account of the noise, and the engine still stalled at low speeds. I next tried an automatic air valve, which simply screwed into the intake. This, like the other devices saved gasoline but did not give the results I thought possible with an air device.

My next venture was a vaporizer. This admitted moist air into the intake. It appealed to the eye, as it was interesting to watch the air bubble through the water in the glass jar, but the thing I wanted was results. I knew that with the proper apparatus a lot of gasoline could be saved, for the simple

reason that the average carburetor gives too rich a mixture about 75 per cent of the time. It is impossible to adjust a carburetor to work economically under all conditions. What I wanted was some simple method of admitting air to the mixture after it left the carburetor, in this way diluting a too-rich mixture, in other words, utilize this surplus gasoline.

One day I met a salesman on the road who was using a hot-air device manufactured by the Karburetor Korrektor Co., at Knox, Ind. After a demonstration I was convinced that it was just what I had been looking for. I sent \$5 and installed this apparatus on my car. It was very easy to install. I bored a $\frac{1}{8}$ -in. hole in the intake and had it on and working in less than half an hour.

It has certainly fulfilled my expectations of what the proper sort of auxiliary air device should do. The principle is correct. A jet of hot air into the intake aids combustion. I do not understand how a cold-air device helps much. What's the use of heating the air before it passes through the carburetor, as is done on the Ford, and then chilling it with a blast of cold air as the mixture passes through the manifold into the engine? It seems to me the hotter the mixture the quicker and snappier the explosion.

This Karburetor Korrektor is controlled from a convenient point on the steering post. One thing about it which appeals to me is the fact that it is out of the way when repairs to the engine are needed. It will adjust instantly to take in hot or cold air. With it I can inject kerosene and water to clean my engine. Another good point is that it is so constructed that dirt and grit cannot be drawn into the engine. It makes no noise. It is a very simple and substantial affair. I have run mine about 15,000 miles and it is still as good as new. There are scarce a half dozen parts to it. It has certainly solved my air problem, and saves gasoline. Mine has paid for itself many times, and I would not take it off if I could not get another right away.—C. S. S.

Fuel Energizers

Geneseo, Ill.—Editor MOTOR AGE—In answer to your inquiry as to the success with fuel energizers I should like to state my experience. While other readers may have had better success than I have had with these devices, I have as yet to find any that give the desired results. In the eight years I have driven cars I used most of the popular kinds, following directions as closely as possible. I found none that would remove carbon or increase power.

For easy starting in winter a small amount of sulphuric ether in the gasoline has proven very successful, but I have not used it extensively, for I do not know what effect it has on the engine.—F. E. Richmond.

Engines

Determination of Horsepower

Q.—How is a brake test for horsepower made?

2.—Can you give me a reliable formula for testing steel?

3.—Of what kind of material are the electrodes of spark plugs made?—Joseph Martin, Parkersburg, W. Va.

1.—There are two methods of determining the brake horsepower of an engine, either by the use of an ordinary form of prony brake as shown in Fig. 1 or by an electric dynamometer. The mathematical method of calculating the power developed is the same in both cases, but as the dynamometer is the most accurate of the two, it is the most used in actual practice.

In the prony brake the power is absorbed by a wooden brake in contact with a water-cooled steel pulley. The lever arm of the brake rests on the platform of a scale from which the turning force of the engine can be read at the various crankshaft speeds. The dynamometer consists of an electric dynamo mounted in a cradle and attached to a beam scale, so that the reaction of the stationary part of the machine can be indicated on the scale in terms of pounds. In testing an engine it

is connected to the prony brake or dynamometer by a universal coupling and then the engine is run at different speeds with wide open throttle to determine its maximum power output.

Horsepower is the product of the factors of weight, time and speed and is the amount of work required to move 33,000 lb. through a distance of 1 ft. in 1 min. The

equation for the determination of horsepower is $\frac{2\pi r F n}{33,000}$ where F is the scale

reading in pounds, r is the radius of the

arm in feet, n is the number of revolutions per minute, and 2π is equal to 6.28. However, if certain lengths of lever arms are used the calculation is very much simplified.

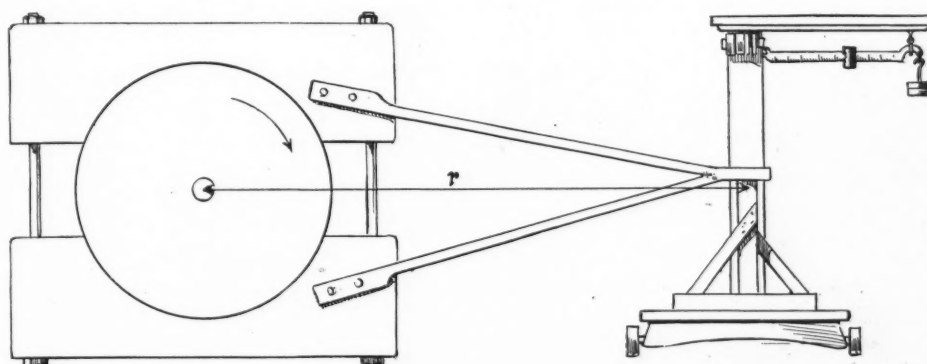


Fig. 1—Prony brake method of determining brake horsepower of an engine

The Readers' Clearing House

Carburetion

Adjusting Marvel on Buick

Q—Give correct setting for Marvel carburetor as used on D-45 Buick.—Coulton J. Harris, Des Moines, Iowa.

The Marvel carburetor used on this model Buick car has three adjustments—gasoline, air and counterweights. But unless you have had occasion to remove or change the carburetor, there should ordinarily be no need for adjusting it, as it was adjusted properly before leaving the factory. The air regulator on the cowl board may be used to vary the quality of the mixture to conform to any local conditions of climate or altitude. The normal running position is with the button pushed clear in. When the button is pulled out as far as it will go it gives a very rich mixture for starting or warming the engine in cold weather. The leanest mixture is obtained when the button is half way out, and this should be used for coasting.

The procedure to be followed in adjusting it is as follows: First close the gasoline needle valve completely by turning it to the right. Then open it about three-quarters of a turn. Next start the engine and after it has run to warm it up push the air button all the way in to the running position. With the spark fully retarded and the throttle nearly closed turn the air adjustment screw until the engine runs smoothly and evenly. This will give you the idling adjustment.

Now advance the spark and open the throttle wide. The counterweight should not begin to lift until the throttle lever is from a third to half the way down the

steering wheel sector. If it does, then change the counterweight adjustment un-

Experience Meeting



What Was Your Experience with Double Treading?

TIRES constitute the chief item of your running costs. Motorists are striving to get all the mileage they can out of their tires and many of them have treads put on worn tires to get additional use out of them, the same as a person has new soles put on his shoes.

Many of you have tried double treading and can give information to others who may be undecided as to the relative merits of it. In writing, tell how long you had driven the particular tire before it was repaired, the condition it seemed to be in, were you satisfied with the job when it was complete and did the cost seem to warrant the repair. Also, when is it not advisable to double-tread a casing? Are you thinking of having any more tires fixed up by this method? If not, why not? How much additional mileage did you get out of a casing so repaired?

This will be used with your signature or not as you prefer, but in every case the letter must carry full name and address.

til it acts correctly. The next step is to determine whether the mixture is too rich or too lean and to regulate it by turning the gasoline adjustment a little at a time. The proper proportions of the mixture may be arrived at best by noting whether the engine runs better with the air regulator button pushed way in or pulled out slightly. If the gasoline adjustment is correct, the best results will be obtained when the button is pushed all the way in.

If a popping noise occurs in the carburetor when the throttle is opened suddenly and the spark advanced, then a weak mixture is indicated. Open the gasoline adjustment slightly. A sluggish engine which exhausts black smoke is being provided with too rich a mixture. If it refuses to idle with the air regulator way in, the air adjustment should be turned slightly. If it picks up sluggishly and lacks proper accelerative quality at higher speeds, the counterweight adjustment should be turned a small amount in whichever direction it gives best results.

Hissing Sound in Carburetor

Q.—I have a Hudson Super Six which makes more of a whistling noise through the air intake than the average Hudson. Can anything be done to eliminate or lessen this?—H. H. Frudenberg, Madison, S. D.

The present model of the Hudson Super-Six is fitted with a special carburetor intake or muffler which eliminates the whistling noise caused by the incoming air. This muffler is in the form of an inverted bell with a small opening at the upper end, forming an expansion chamber that eliminates all sound.

The Experiences of Others

Water Vapor Injection

Brookline, Mass.—Editor MOTOR AGE—In response to your request for experiences with devices for introducing water vapor into the cylinders, may I submit the following?

The apparatus consists of an aluminum alloy tank holding about a quart, which is fastened to the exhaust manifold. From the top of the tank a copper tube of about 1/8-in. bore leads to the intake manifold, entering just above the carburetor and during its course wound two or three times about the exhaust pipe. The concern manufacturing this outfit is the Oxygenerator Co., Chicago.

The air is drawn by suction into the tank which contains water, then around the hot exhaust pipe and, finally, mixing with the gas in the intake, enters the cylinders. On entering the tank, as the device reached me, the air was drawn over the water, but I found it advisable to solder a piece of copper tubing to the intake air valve, so that the air must bubble up through the water, thereby increasing its degree of saturation.

The car to which this is attached is an Owen-Magnetic, fitted with a Buda six-cylinder engine. Now with the Entz transmission it is possible to transmit the power of the engine to the rear wheels without having the wheels revolve by having the brakes set and moving the speed lever into a position. After this has been done the relative power being produced at any time readily may be estimated by a glance at the torque meter.

After the installation of the Oxygenerator it was quite surprising to note the added power as registered by the meter,

which also meant added gasoline mileage. But as to its absolute elimination of carbon I cannot speak quite so highly. Although it prevents to a considerable extent its formation, it does not entirely stop it. This, of course, will vary with different engines depending to a large extent upon the amount of oil getting into the combustion chamber.

Let us consider for a moment just what such a device is supposed to do and also a few of the methods by which this result is achieved. All such affairs have as their prime function the introduction of small quantities of water vapor and not infrequently water itself, into the intake manifold, in either a hot or cold condition. The latter method would seem to be contraindicated, for why introduce a cold water vapor into an already none too well vaporized mixture? It would tend merely to undo the work done by the preheating of the air to the carburetor, a practice which is now almost universal. Then again, if water enters the combustion chamber it is going to detract from the available heat for power just 537 calories per gram of water, this being the latent heat of vaporization. Of course, the amount of water in each explosion is very small so that this would not be a serious drawback. But after considering the pros and cons it seems to me the better practice would be to preheat the water merely by passing the tube around the exhaust pipe.

It is claimed for many of these devices that the water upon entering the combustion chamber is dissociated, or broken up, into its component parts of oxygen and hydrogen, thus allowing the oxygen to burn up the carbon. This seems to me hardly the explanation, for when we stop to consider that at a tem-

"Unclaimed Mail"

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H. C. F.....Chicago
A Reader.....Collinsville, Okla.
A Motor Age Reader.....
.....Chattanooga, Tenn.
A Reader.....Cheyenne, Wyo.
A Reader.....Chicago
R. A. Y.....Clark, S. D.
J. A. D.....Cincinnati, Ohio
G. J. L.....Clark Grove, Minn.
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A Reader.....Newton, Iowa
.....Odebolt, Iowa
F. B. P.....Omaha, Neb.
F. P.....Paris, Ky.
A Reader.....Peoria, Ill.
A Reader.....Peru, Ind.
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G. B.....Rock Island, Ill.
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A Reader.....
.....Ft. Sam Houston, San Antonio, Tex.
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A Subscriber.....
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A Subscriber.....
An Old Reader.....
A Subscriber and Reader.....
Louis D.....
D. McLean.....

a heavier mixture being drawn into the first and second cylinders, I am led to believe he is right. In my experience with the burning out of connecting rod bearings, I find that the first and second rods are invariably the ones that burn out, which should be the last ones to burn out if there is an excess of lubricating oil. Tapered rings and drilling chamfered ring grooves, which keep the plugs dry, tend to pump this excess gasoline into the crankcase.—W. T. Folsom.

The Electric System

Wiring of 1915 Paige

Q.—Show wiring diagram for two-unit Gray & Davis starting and lighting for 1915 model Paige.—Henry E. Klik, Seattle, Wash.

A wiring diagram for this is shown in Fig. 6.

Ammeter on 1916 Saxon

Q.—I have a 1916 Saxon roadster fitted with electric lights and starter. What is the simplest method of installing and connecting the ammeter?—Constant Reader, Omaha, Neb.

To connect an ammeter on this model run the wires to the instrument as shown in Fig. 5.

Maximum Magneto Voltage

Q.—What is the maximum voltage output of a Bosch high-tension magneto?—Esca Forgy, Shamrock, Tex.

1—This is not definitely known. It may at extremely high speed be as much as 35,000 volts.

Testing Coils and Armatures

Q.—Give a practical scheme for testing Dixie magneto coils and magneto armatures of the slip ring type as used on the Bosch and Eisemann magnetos. I have no equipment for this kind of testing except a 6-volt storage battery. Can I get good results with this? Explain the test racks they use for this work.—R. W. Pennington, Spokane, Wash.

You can test a Dixie magneto coil and the armature of any high-tension magneto of the Splitdorf type by connecting one terminal of your storage battery with one terminal of the coil or armature; then connecting a wire to the other terminal of the

battery and brushing the end of this wire against the other terminal of the coil or magneto. If there is an open circuit, that is, if the wire in the coil or armature is broken in any place, you will not get any results. On the other hand, if the coil or magneto armature is intact, you will get a spark.

It is impossible to test for short-circuits if no other apparatus than a battery is at hand. There is little use in the repairman trying to determine the nature of a fault in a coil, for unless the trouble is around the terminals the coil has to be returned

to the factory or repair station anyway.

The testing device to which you presumably refer consists of an electric lamp on the service mains, with one of its cords cut and two lengths of insulated wire with steel pins at the end soldered to the cord ends.

Polarity Reversibility of Generators

Q.—Is it possible to connect the battery on any car with a strictly magnetic field generator without reference to the polarity of wires from generator? That is, will or will not the polarity of the generator be reversed with battery wrongly placed so as to charge battery same as when normally connected? This, of course, would upset the reading of ammeter on current indicator, but that is not to be considered in this question. If there are exceptions to the above give types in which this would not hold.

2—What current or part of current passes through indicator during the cranking operation on the Dodge Brothers car?—Coulton J. Harris, Des Moines, Iowa.

1—Practically all forms of commercial generators for use with motor cars are of the non-reversible type, so far as polarity of the machine is concerned. Connection of the generator in the wrong polarity to the generator could happen only through an error in connecting the system. The reason that most of the generators are not reversible is that there is no balance between the electrical pressure and the internal resistance of the generator and battery. The battery generally overcomes the generator in this respect and consequently, if the polarity accidentally is connected up wrong, the generator will be operating under a short-circuit. The preponderance of the battery increases as the battery ages on account of the increase in internal resistance. Thus while there might be a chance for reversal while there was a balance of conditions, this probability becomes less as the age of the battery increases.

To make reversal of polarity possible,

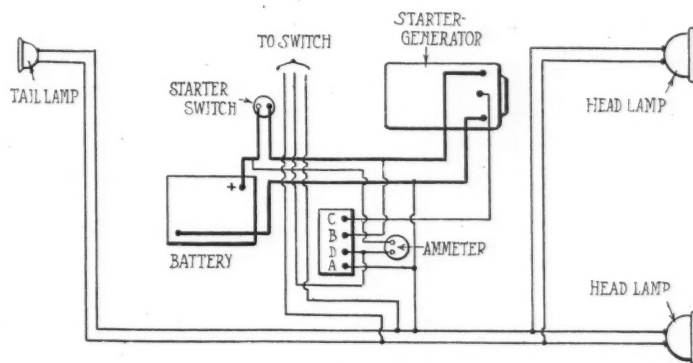


Fig. 5—Diagram of starting and lighting system on Saxon car

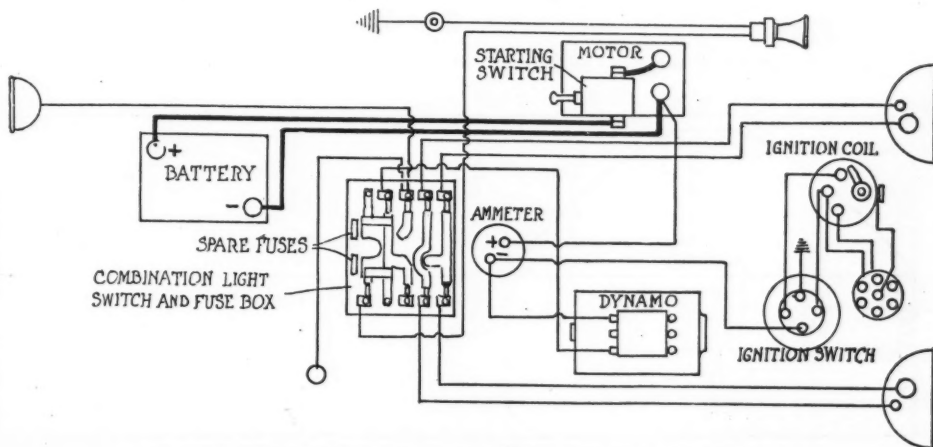
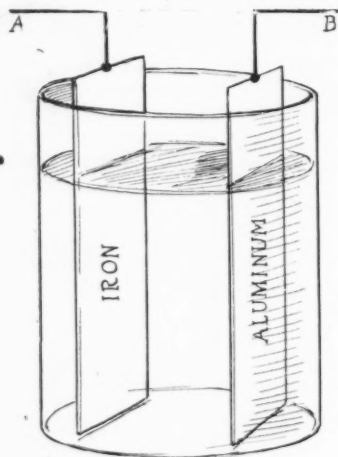


Fig. 6—Wiring diagram for Gray & Davis system on 1915 Paige

the electrical pressure in the machine must balance that of the battery. Also the generator must be so designed that the internal resistance must balance that of the battery. Thus a complete balance exists between the two parts concerned. It is possible that due to the higher resistance of an old battery that this condition might be destroyed, but the probability of this occurring in actual practice is small.

The Bijur system is an electrical system with a polarity reversing switch. In this system, if we assume the generator to be at rest, then the reversal of the polarity reversing switch actually reverses the battery connections at the point where the generator charging lines leave the voltage regulator. When the generator starts to revolve it builds up a potential in the same direction that it had before reversal. At the instant the automatic switch closes, the battery voltage predominates and the momentary discharge reverses the shunt field and at the same time the battery current through the armature reverses it so that the polarity of the generator is reversed. As the connections between the battery and generator have been reversed through the polarity reversing switch, the generator charges the battery in the proper direction.

2—The starting current required to break away an engine varies from 250 to 400 amp. depending upon the stiffness of the engine. Obviously, this heavy current flow would burn out an ammeter constructed to register only about 20 amp. as a maximum, therefore the ammeter must be connected into the line leading from the generator to the battery to avoid the heavy discharge from the battery when starting the engine. Then the ammeter will register



Figs. 7 and 8, left to right—Immersion of plates in solution in home-made rectifier

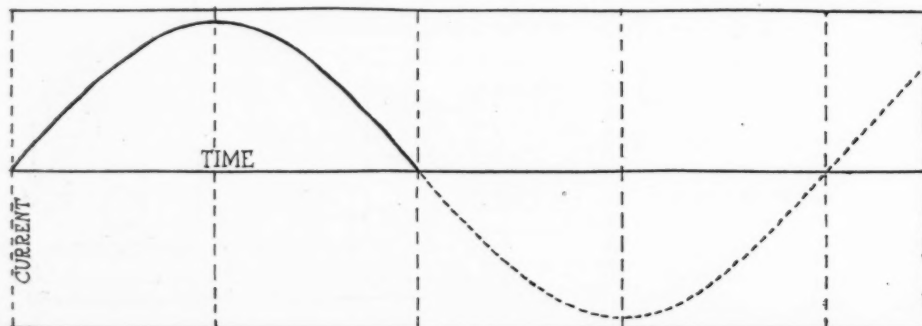


Fig. 9—Current curve when direction is from aluminum to iron plate

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has segregated inquiries into classes of allied nature. Questions pertaining to engines will be answered under that head and so on.

CARBURETION

Coulton J. Harris...Des Moines, Iowa
H. H. Frudenberg...Madison, S. D.

EXPERIENCES

C. W. Schwartz...Brookline, Mass.
C. S. S...Kentland, Ind.
F. E. Richmond...Geneseo, Ill.

ENGINES

Joseph Martin...Parkersburg, W. Va.
W. Thornton Mays...Marshall, Tex.
Constant Reader...Omaha, Neb.
L. J. Charles...Santa Fe, N. M.

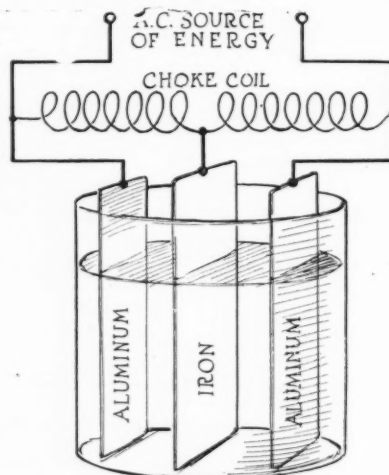
MISCELLANEOUS

W. T. Folsom...Ardmore, Okla.
Abram Hammatt...Topeka, Kan.

THE ELECTRIC SYSTEM

Henry E. Kik...Seattle, Wash.
Constant Reader...Omaha, Neb.
Esca Forgy...Shamrock, Tex.
R. W. Pennington...Spokane, Wash.
Coulton J. Harris...Des Moines, Iowa

only the charging rate of the generator or the discharge due to the use of the lamps



or other equipment requiring only a light current supply.

Charging from Alternating Current

Q.—Some time ago you stated to an inquirer that you would publish in the near future a diagram of a home-made rectifier for charging storage batteries on alternating current. I should like to have a diagram of this rectifier.—William H. Harris, Harvey, Ill.

To charge a storage battery, it must be connected to a source of electrical energy which will produce a uni-directional, or direct, current through the battery in a direction opposite to the direction of the electrical pressure of the battery. Such a source of electrical energy is not always available, but very often a source of electrical energy capable of producing an alternating current is available and in such cases it is necessary to change the alternating-current into direct-current, in order that use may be made of the source of energy in charging the battery. The purpose of the electrolytic rectifier is to change the alternating current into direct.

The operation of the electrolytic rectifier is based upon the simple fact that certain electrolytic cells, having electrodes of different metals, will allow a current to pass through them in one direction without offering very much opposition but will offer a high resistance to the current passing through the cell in the opposite direction. For example, if a plate of iron and a plate of aluminum be immersed in a solution of ammonium phosphate as shown diagrammatically in Fig. 7 and the two plates thus connected to a source of alternating pressure, the following results will be obtained:

The alternating pressure between the terminals of the cell A and B tends to send a current through the cell first in one direction and then in the opposite direction and if the resistance of the cell were independent of the direction of the current, an alternating current would be produced and this current could be represented by a curve of the form shown in Fig. 10, in which the distance of the curve above or below the line corresponds to the value of the current, the current being in one direction when the curve is above the line and in the opposite direction when below the line. Quite a high resistance, however, is offered by the electrolytic cell when attempt is made to send a current through the cell in a direction from the aluminum to the iron plate. As a result of this high resistance to the current, there is, in reality, practically no current through the cell in one direction, as compared to the value of the current through it in the opposite direction. This results in the current curve being of the general form shown by the full line in Fig. 9. The dotted portion represents the part of the current curve shown in Fig. 10, which has been reduced to practically zero by the action of the electrolytic cell. The high resistance offered by the cell supposedly is due to a high-resistance film formed at the surface of the aluminum when the current is in the direction from the aluminum to the iron plate.

In the case just described, use is made of the available pressure just half of the time, hence there is current in the circuit only half of the time. A storage battery connected in such a circuit could

not be charged very satisfactorily or efficiently. A better arrangement of the cell may be made as shown diagrammatically in Figs. 8 and 11. Two aluminum plates are used instead of one and they are connected to the alternating source through what is called a choke coil, as shown in Fig. 11.

The operation of this combination may be followed briefly as follows: Let us assume a current in the alternating-current line in the direction is indicated by the arrows marked 1 and 2. The current meets with a high opposition in trying to pass from the left-hand aluminum plate to the iron plate, and as a result the current in this circuit is practically zero. There is, however, a circuit of relatively low resistance from the point A to B, through the battery to the iron plate, through the electrolytic cell to the right-hand aluminum plate and then to the point C. As a result of this current passing through the part of the winding of the choke coil from the point A to the point B, a current will be induced, due to transformer action, in the part of the winding between points B and C, and the direction of this induced current will be from the point C to the point B, where it combines with the current from the point A and gives the total current through the battery. This results in a current in the battery approximately twice as great as the current in either part of the winding of the choke coil.

When the current in the alternating-current circuit reverses, there will be no change in the direction of the current through the two sections of the choke coil, but both currents will still be toward the point B and through the battery, which results in the battery current being of the general force shown in Fig. 12. The dotted portion of the curve which was lost by the arrangement shown in Fig. 7, is now reversed in direction relative to the upper loops, and as a result all the current loops above the horizontal line, or the current through the battery, is more nearly continuous in value, which gives a much better result in charging the battery.

Sizes of Plates

If the electrolytic cell is to be self-cooling, the aluminum plates should be of such a size that there are about 7 sq. in. of surface for each ampere of direct current and the iron plates should have at least twice or better still, three times the area of the aluminum plates. The distance between the plates should be about $\frac{1}{2}$ in. The containing vessel should be, if possible, of such a size that there is about 1 sq. ft. of radiating surface for each ampere of direct current. A good size granite bucket will serve very well for a containing vessel. The dimensions of the plates may be made such that they will best fit in the containing vessel and small ears may be left on their upper corners to be used as terminals and as means of supporting them from small wooden strips laid across the top of the bucket. The electrolyte should be an approximately neutral solution of pure ammonium phosphate.

The size of the containing vessel and also the area of the plates may be reduced considerably by using some artificial means of cooling, such as circulating cold

water through pipes immersed in the electrolyte, or the electrolyte itself may be circulated through cooling coils outside the containing vessel.

The efficiency of such a rectifier at best is about 60 per cent and its operation as a whole is not very satisfactory. The direct-current voltage is less than half of the alternating-current voltage. You must remember that the direct-current through the battery is not steady in value but pulsates, and as a result a direct-current and an alternating-current ammeter will not indicate the same volume of current when connected in series with the battery, since the direct-current ammeter indicates the average current and the alternating-current ammeter the effective current.

With the arrangement shown in Fig. 11, it will be necessary to reduce the value of the direct-current voltage to charge a starting or lighting battery, if the source of alternating-current is a 110-volt-circuit. This reduction in direct-current voltage can be taken care of in several ways. A resistance may be connected in series with the storage battery and the value of the charging regulated by varying the value of this resistance as conditions may demand. Or, a resistance may be connected in series with the choke coil and the al-

ternating voltage actually applied to the choke coil terminals adjusted to meet the requirements, when the rectifier is operating by varying the value of the resistance. Both of these methods are very inefficient, as there will be a considerable loss in the resistance, depending upon its value in ohms and the current through it. A more efficient means of reducing the voltage applied to the terminals of the battery circuit is to use a small transformer with several secondary taps, which give different values of secondary voltage and hence the direct-current voltages will be different.

A choke coil that can be used on a 110-volt alternating current circuit can be made by winding 300 turns of No. 16 B. & S. gage cotton-covered copper wire on an iron ring having a mean diameter of about 5 in. This ring can be made by winding a quantity of soft iron wire in a suitable form of some kind until the area of the cross-section of the ring is about 1 sq. in. A choke coil of this kind should be capable of taking care of about 8 amp. direct-current, and the direct-current voltage should be in the neighborhood of 20 to 50 volts. In winding the ring, do not forget to make an electrical connection at the center of the winding.

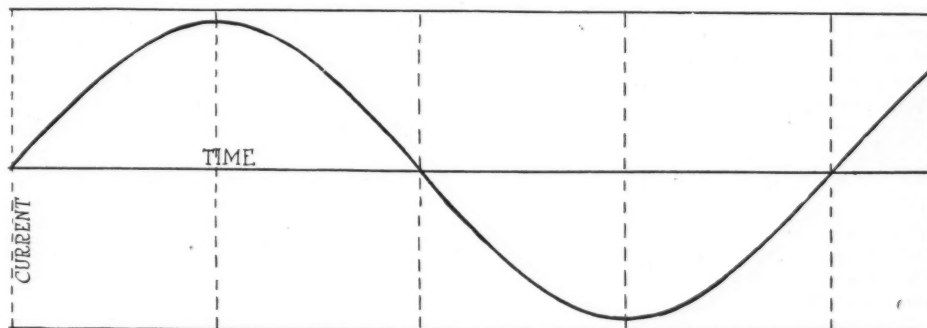


Fig. 10—Curve of current if resistance of cell were independent of direction of current

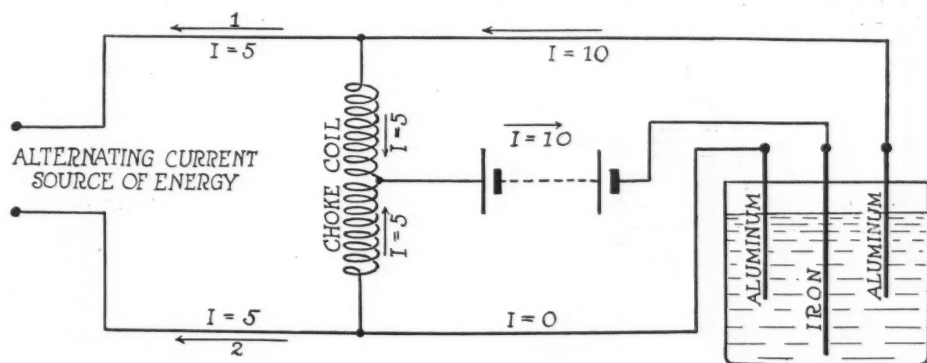


Fig. 11—Arrangement of rectifier in which a choke coil is used

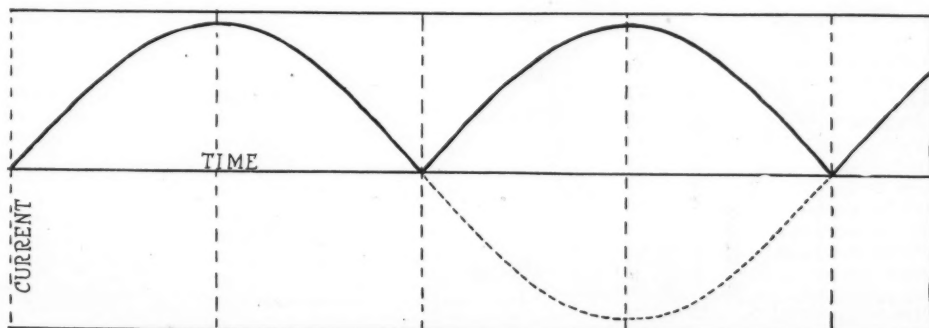


Fig. 12—Curve of current with arrangement as in Fig. 11

American Sleeve-Valve Engine

Valve Gear Replaced in Four-Cylinder With High Horsepower for Displacement

THE dominant feature of the American sleeve-valve engine is the revolving cylindrical sleeve between the piston and cylinder wall, which replaces the valve gear of the poppet-valve type of engine. This sleeve, which is lubricated by an oil film between the bearing surfaces, has no vertical movement whatsoever and in revolving passes the intake and exhaust ports in the cylinder at the proper time. The valve gear as a whole consists of the rotating sleeve, which is driven by a worm gear from the bottom of the sleeve. By this the number of parts are reduced considerably over that of the poppet type of valve gear.

One of the features of the valve gear is that the timing characteristics are not affected by the crankshaft speed of the engine as in the case of the poppet valve type, in which the loss of power at high speeds can be traced in many instances to the inertia effects of the reciprocating parts of the valve gear, which at high speeds no longer will follow the contour of the cams. On account of the rotating motion of the sleeve it receives equal wear from the piston, insuring a uniform piston clearance and uniform compression.

The area of the intake and exhaust ports can be made large, and this makes possible very good scavenging action during the exhaust stroke, as the cylinder can be exhausted through an unobstructed port. The single sleeve also makes possible efficient cooling.

The engine is lubricated by a force-feed system which gives a constant pressure to guard against over-lubrication. The oil is carried to the upper part of the cylinders

by spiral grooves, which furnish the supply of oil for the oil film between the sleeve and the cylinder wall. The crankshaft is of the counterbalanced type and the pistons are light in weight. The crankcase and several other parts are made of aluminum.

The four-cylinder engine, which has a bore of 4 in. and a stroke of 5 in., develops a rather high horsepower for its displacement. The N. A. C. C. rating of the engine at a piston speed of 1000 ft. a minute is 25.6 hp., while the engine actually delivers 43.6 hp. at this piston speed. A test made on this engine by the manufacturer is as follows:

RPM.	BHP.
400	4.96
600	10.20
800	20.80
1200	43.68
1600	50.88
2000	54.00
2400	56.88

From a production standpoint the engine represents practically straight machine work through the entire assembly. It is manufactured by the American Sleeve-Valve Motor Co., Philadelphia, Pa.

WOULD REPAIR CARS NOW

Chicago—Editor MOTOR AGE—There has been a very strong tendency on the part of car owners to put their cars in dead storage as soon as the real cold weather sets in. These cars are invariably kept in storage until nice warm weather in the spring, and then there is a rush for repair shops.

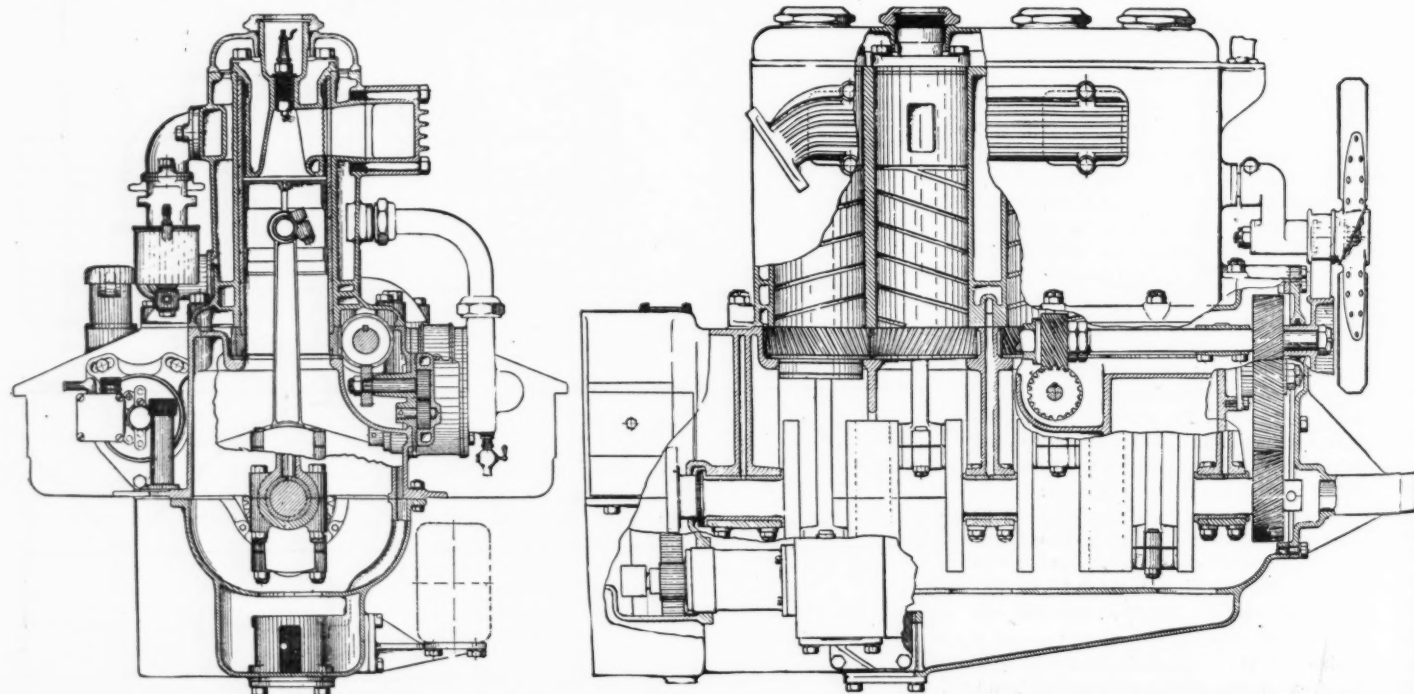
In our business we have an excellent opportunity to observe how this works.

There is thousands of dollars worth of work that should be done on these cars before they are put in commission and in a great many cases, in fact, in most of the cases, the repair shops are so busy that they simply have no opportunity to do the absolutely necessary repairs, and a great many details that should be taken care of are neglected. This means that the life of a car is shortened materially. It means that during the extremely cold weather, repair men are sitting around like farmers playing tag with their thumbs, and just as soon as warm weather comes they are so busy that working day and night they cannot take care of it all.

In our business, we make it a point during the quiet season to work on stock that we anticipate will be used during the rush period. If it were not for this, we would not be able to take care of one-half of the business that is given to us.

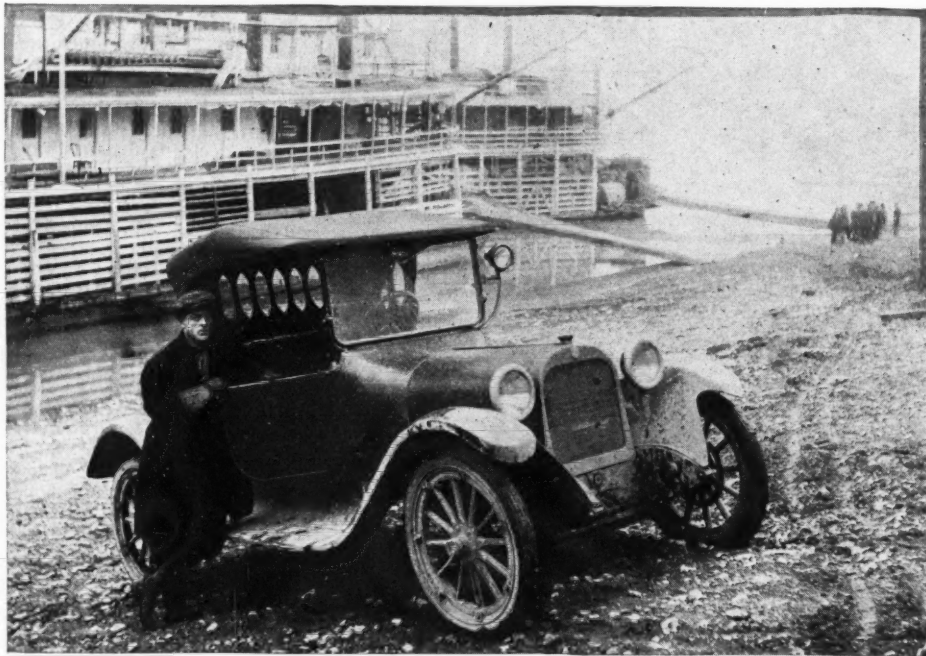
We believe if the different trade papers would take hold of this proposition and by constantly hammering at it, during the real cold weather, they will convince the car owners that it would be to their advantage to put their cars in for repairs at the present time rather than waiting for spring.

Another thing; we are optimistic enough to believe that next spring there is going to be a great demand for cars. At the present time it is common knowledge that there is nothing like the number of automobiles being made that there has been heretofore. The Government is taking over a great amount of the output of several factories. This will mean that there will be a big demand for good used cars.—Houpert Machine Co.



End view of American sleeve-valve engine, left, and side view at right, showing sleeve gears and counterbalanced crankshaft

Among the Makers and Dealers



GOODRICH CAR COVERS SUNNY SOUTH—Two means of transportation being used extensively in the South now, one is a Cumberland River steamer and the other a test car belonging to the B. F. Goodrich Rubber Co. The boat is carrying freight and the test car, with fourteen companion cars, is gathering data on the new rural motor car delivery route in Tennessee. The cars to date have gathered 20,000 miles of road data

GOSS Joins Bostaph Engineering Corp.—A. H. Goss, for many years with the General Motors Co. and the Chevrolet Motor Co. in New York, has resigned to devote his time to the Bostaph Engineering Corp., which controls the Ramage process for the manufacture of gasoline and is at Ecorse, Mich.

Detroit Weatherproof Body Expanding—The Detroit Weatherproof Body Co. has greatly increased its business during the last year. It is now producing 150 tops a day, and by making over of a factory unit now used for storage purposes to production will increase its daily output to 250 tops.

Shabe to Manage Zenith Sales—V. I. Shabe, who has been associated with the Zenith Carburetor Co. for the last five years, the last three as manager of the New York branch, has been appointed sales and advertising manager of the company, succeeding A. H. Doolittle, who has resigned.

Thompson to Manage Foreign F-W-D Sales—C. S. Thompson has been appointed manager of foreign sales of the Four-Wheel-Drive Automobile Co., Clintonville, Wis., to fill the vacancy caused by the resignation of J. M. Homs, who has become associated with his brother in the exporting business in New York.

Quadrupled Output in Last Two Years—The American Forging & Socket Co. has quadrupled its output in the last two years. The socket department has increased its capacity to 1000 sets a day and employs 150 men. The forging department has added equipment for turning out 5,000,000 forgings a year.

Spranger Wire Wheel Elects Officers—The Spranger Wire Wheel Corp. has elected the following officers: Dr. N. M. Spranger, president; Jacob M. Schaefer, vice-president; William Finzel, treasurer; John F. Reinke, secretary. J. Robert Wilkin has been appointed sales manager; Albert J. Hall, assistant general manager; Ed T. Walling, sales manager

and director of purchases; Frank Spranger, chief engineer, and C. R. Watson, head of the credit department. The company is now producing 200 sets of wire wheels a day.

Lincoln Motor Plant is Enlarged—Five new units have been contracted for in the plant of the Lincoln Motor Co., engaged in building the Liberty aircraft engine. The new units consist of a heat-treating building, an assembling plant, two testing buildings and a one-story brick and reinforced concrete structure for manufacturing purposes.

Body Hardware Plant Increases Capacity—Additions to the plant of Joseph N. Smith & Co., manufacturers of motor car body hardware, have brought the plant space up to 77,000 sq. ft. The factory consists of a complete brass foundry, japanning, tumbling, polishing, heat-treating, plating, windshield and assembly departments, with machine and storage equipment and space.

Peoria Tractor Co. Expands Capital—Due to increased business and war contracts the Peoria, Ill., Tractor Co. has increased its capital stock from \$60,000 to \$1,500,000. The officers are: F. R. Dennis, president; George McFarland, secretary, and E. M. Smith, manager. It is planned to retain the main plant at East Peoria, but branch plants will be opened from time to time at points in other states which offer the most satisfactory inducements.

Wisconsin Restricts Use of Dealer Licenses—Important rulings respecting the rights of motor car dealers in Wisconsin in the use of dealers' license plates have been made by the attorney general of the state in response to the request of the secretary of state, who was besieged with appeals for definite instructions under the new Wisconsin motor code of 1917, now effective. The rulings are to the effect that dealers have not the right to use cars operating under dealers' licenses for their own private use or for use by members of their families. In fact, the use of a

dealer's license is restricted to a car used for demonstration purposes only.

Oakland Relieves Its Pacific Distributors—Two hundred and fifty Oaklands, making up a solid train of fifty freight cars, are en route for Seattle, Wash. This marks the first of the heavy shipments going through the north Pacific section to the Oakland distributors, and it is anticipated that the termination of the delays in shipment is in sight. In this shipment are 165 touring cars, twenty roadsters, thirty-eight convertible sedans, eight coupes, eighteen roadster coupes and one town car.

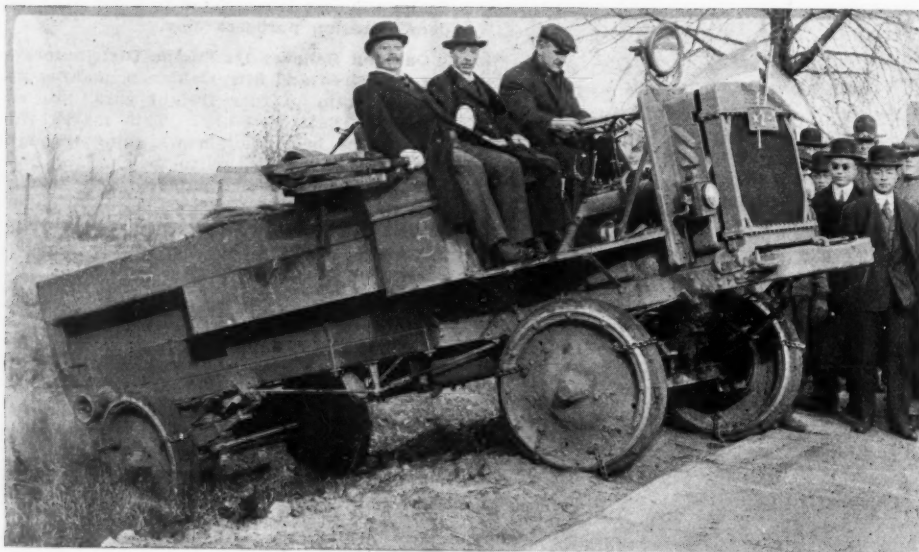
State Instruction for Electric Service—A class in the manufacture, care and repair of starting, lighting and ignition systems of motor vehicles has been established by the University Extension Division of the University of Wisconsin at its branch in Milwaukee, Wis., for both employers and employees of garages and service stations in Milwaukee and vicinity. The course will consist of twelve evenings' work. Later the course will be presented in other Wisconsin cities.

Lavigne Mfg. Co. Changes Name—The Lavigne Mfg. Co., manufacturer of motor car specialties, mechanical oilers and a kindred line of brass and aluminum goods, has changed its name to the Commonwealth Brass Corp. This denotes no change in the policy of the company, only a change in name. The officers are: P. D. Dwight, president; N. A. Henwood, vice-president and general manager; C. L. Brumme, secretary and treasurer; C. S. Kellum is superintendent.

Onelda Truck in New Plant—The Onelda Motor Truck Co., Green Bay, Wis., has completed the transfer of the machinery, equipment and stock from the temporary quarters it has been occupying during the last year into its new works, and the capacity is being increased to 100 trucks a month. The new factory is 150 by 476 ft., affording 70,000 sq. ft. of floor space. The maximum capacity is about 275 trucks a month, which it is hoped to reach within several months' time. A Pacific coast branch is being opened in San Francisco.

Bloomington Solves Used Car Problem—The used car problem at Bloomington, Ill., was solved to the satisfaction of the dealers when a contract was made with J. E. Smith of Decatur, Ill., to open a depot there and take over all of the second-hand cars secured by the dealers in trading for a new car. According to the contract, when a dealer has an opportunity to take in a used car in a trade, Smith is sent for and appraises the car. His price is final and must stand with all other dealers in case the patron decides to take up a trade elsewhere. When the trade finally is completed, the used car is turned over to Smith at 80 per cent of its valuation. When he sells it he realizes 20 per cent profit and retains the privilege of rejecting cars of higher value than \$600, although he will make the appraisal as usual. On the higher-priced used cars he is allowed the option of taking or leaving them. In the event that he has a call for such a high-priced used car he has the privilege of making the sale. He obligates himself to take all used cars which he appraises at less than \$600, and the dealers thus are relieved of all old cars except those of the higher grades. In taking the used cars Smith pays the dealer ten per cent of the value on delivery and the balance when he sells it.

From the Four Winds



CHINESE OFFICIALS TRY OUT NASH—Here are the Chinese trade officials in the act of testing out a Nash quad. They are Lieutenant General Ching Ting Tzu and Commander Li King Hen, who agreed the mud and sand had nothing on Chinese roads

NORTH DAKOTA Registers 62,994—In 1917 62,994 motor car licenses were issued and 834 motorcycle, while 1007 licenses for dealers were given.

Ohio Gains 100,000 Cars—Ohio now has 344,155 cars, marking an increase of approximately 100,000 cars in the last year. The same statistics show that Cleveland purchased 10,000 cars in the last year and a total of 52,888 were licensed in Cuyahoga County. This is 11,800 more than were registered in the preceding year.

Cuts Out Show to Save Fuel—Dealers of Bloomington, Ill., voted this week not to put on the annual midwinter motor car show, usually held the last week of February, the scarcity of coal and other unfavorable conditions being taken into consideration. The sentiment favored an outdoor show around the courthouse square as early in the spring as the weather will permit. Such a show was staged last August and many sales were traceable to it. There is a great saving in rent, heat, light and other expenses and the public is put to no inconvenience or expense to witness the display. It is believed that in the future the dealers there will plan for a spring and fall outdoor show, and, by a suc-

cession of these events with re-employment of supplies for illuminations, etc., keep the cost down to the minimum.

Motors Pay Michigan \$2,471,270.77—Michigan motor vehicle revenue for 1917 amounted to \$2,471,270.77. This was divided as follows: passenger, \$2,175,276; commercial, \$161,185; motorcycles, \$19,194; manufacturers and dealers, \$42,394; chauffeurs, \$36,550; transfers, \$11,534; duplicates, \$21,857, and non-residents, \$3,269.

Indiana Licenses 192,192 Cars—Indiana records show a total of 192,192 cars for 1917, or one car for every fifteen persons in the state. Since the present license law became effective, in 1913, a grand total of \$2,770,420.34 has been paid into the license fund. The total number of cars in the state in 1916 was 139,317, the increase during the last year being 52,875. The dealers' licenses this year numbered 1121, against 997 for the previous year.

California Fights Commission Evil—California motor organizations have taken active steps to fight the commission evil. It has been made a misdemeanor under the motor vehicle act of 1917 for a chauffeur or other person having the care of a motor vehicle

for an owner to take anything in the shape of a bonus or commission in purchasing supplies, parts or materials. The organizations which are interested actively in this movement are the Garage Owners' Protective Association, California State Automobile Association and the California Automobile Trades Association.

Wisconsin Dealers to Show Feb. 13-17—The third annual southwestern Wisconsin motor show will be held at Madison, Wis., Feb. 13-17 under the auspices of the dealers' division of the Madison Association of Commerce, which recently was organized as a co-ordination of all business and civic associations of Madison. The first two shows were conducted by the Madison Automobile Dealers' Association, which is included in the merger.

Connecticut Denies Licenses to Drug Users—Connecticut has taken up fifty-two licenses held by operators addicted to the use of drugs. Investigation by the commissioner of these cases showed that twenty-seven of the operators had been in accidents. The commissioner is satisfied that several accidents were due to the inability of the operators to control their cars while under the drug influence. The commissioner also has obtained lists of persons throughout the state who use drugs habitually. Such persons applying for a license will be denied.

Truck Cuts Costs on Stage Route—A saving of 20 per cent in the cost of hauling general merchandise, gasoline and motor oils 100 miles over the mountains of Nevada was made by motor equipment for the Tippet Mercantile Co., Tippet, Nev. Formerly a single trip carrying 3 tons cost \$40. Six horses were used and it took four days to make the entire journey of 100 miles. The Tippet company tried the motor experiment with a 1½-ton Federal truck and found it would make the 100-mile trip in a single day. In the four days formerly consumed in making one run the motor truck will transport six tons of merchandise at a cost of \$16 a trip, a saving of \$2.67 a ton. It was possible to make but six trips a month with the horse equipment, which would transport a total of 18 tons; the motor truck now will show a monthly average of twenty-five trips with a total transportation of 37½ tons in that time. Figuring the saving at \$2.67 a ton on the difference in the total haulage of both means of transportation the motor truck represents a monthly saving to the company of \$100.13 in its delivery costs alone.

MEETINGS

Feb. 1—Chicago, S. A. E., War dinner at Hotel Morrison.

SHOWS

Jan. 9-27—Cleveland, Ohio.
Jan. 11-18—Washington, D. C.
Jan. 11-19—Providence, R. I.
Jan. 12-19—Philadelphia, Pa.
Jan. 14-19—Rochester, N. Y.
Jan. 16-25—Milwaukee, Wis.
Jan. 19-26—Montreal, Canada.
Jan. 19-26—Detroit.
Jan. 19-27—Cleveland, Ohio.
Jan. 21-26—Scranton, Pa.
Jan. 21-26—York, Pa.
Jan. 21-26—Buffalo, N. Y.
Jan. 21-26—Wilmington, Del.
Jan. 22-26—Oklahoma City, Okla.
Jan. 22-26—Baltimore, Md.
Jan. 26-Feb. 2—Chicago.
Jan. 26-Feb. 2—Harrisburg, Pa.

Coming Motor Events

Jan. 26-Feb. 2—Columbus, Ohio.
Feb. 2-9—Minneapolis, Minn.
Feb. 5-9—Binghamton, N. Y.
Feb. 7-13—Portland, Ore.
Feb. 11-16—Kansas City, Mo.
Feb. 18-23—St. Louis, Mo.
Feb. 11-17—Toledo, Ohio.
Feb. 16-24—San Francisco, Cal.
Feb. 18-23—Syracuse, N. Y.
Feb. 18-23—Grand Rapids, Mich.
Feb. 18-23—Springfield, Ohio.

Feb. 18-23—Des Moines, Iowa.
Feb. 18-23—Duluth, Minn.
Feb. 18-23—Nashville, Tenn.
Feb. 18-25—Pittsfield, Mass.
Feb. 18-27—South Bethlehem, Pa.
Feb. 20-24—Quincy, Ill.
Feb. 20-23—Des Moines, Iowa.
Feb. 23-March 2—Duluth, Minn.
Feb. 25-March 2—Salt Lake City, Utah.
Feb. 25-March 2—Muskegon, Mich.
Feb. 25-March 2—Indianapolis, Ind.
Feb. 26-March 2—Omaha, Neb.
Feb. 27-March 2—Columbus, Ohio.
Feb. 27-28—Burlington, Iowa.
March 2-9—Boston, Mass.
March 6-9—Clinton, Iowa.
March 6-9—St. Joseph, Mo.
March 6-9—Sioux Falls, S. D.
March 16-20—Great Falls, Mont.
March 20-23—Trenton, N. J.
March 20-23—Holdrege, Neb.
April 9-13—Stockton, Cal.